
A SYNOPSIS OF *OCOTEA* (LAURACEAE) IN CENTRAL AMERICA AND SOUTHERN MEXICO¹

Henk van der Werff²

ABSTRACT

Ocotea is the largest genus of Lauraceae in Mesoamerica (Central America and Southern Mexico, i.e., the area between the Isthmus of Tehuantepec in Mexico and the Panamanian–Colombian border) with 102 species recognized. The most recent treatment of Mesoamerican *Ocotea* was published by Carolyn Allen in 1945. It included 33 species and is now seriously outdated. A synopsis of the genus as it is currently known from Mesoamerica is presented here, consisting of a key to species, synonymy, type information, some brief notes on characters useful in their identification, and distribution by country and altitude.

Key words: Central America, Lauraceae, Mesoamerica, *Ocotea*, southern Mexico.

Lauraceae are a large and ecologically important family of trees and shrubs in wet tropical forests from sea level to the tree line at about 3000 m. The family is rare or lacking in areas with a pronounced dry season. Lauraceae have the reputation of being a difficult family, partly because of problems with generic delimitation and partly because many species are trees with inconspicuous flowers and therefore difficult to find and are infrequently collected with flowers. A key to the genera of Lauraceae in the Neotropics was published by van der Werff (1991); this key was based on floral and vegetative characters but did not include fruit characters. Combining fruit and floral characters in a key makes it almost impossible to use because herbarium specimens do not as a rule have both flowers and fruits. By far the largest of the genera of Lauraceae in the New World is *Ocotea* Aubl., with an estimated 300+ species in the Neotropics (van der Werff, 1991) or 350 including the African and Madagascan species (Rohwer, 1993). *Ocotea* is characterized by its stamens with 4 locelli, these arranged in 2 pairs, unisexual or hermaphrodite flowers, a lack of papillae on the stamens or tepals in most species (papillae are present in a few species, but these have the locelli clearly arranged in 2 pairs), and the tepals free, not basally united, and falling off in old flowers or rarely persisting on the cupule. In this way *Ocotea* is not very well defined, and both van der Werff (1991) and Rohwer (1993) suggested that *Ocotea* serves as the catchall genus for species with 4-celled stamens that do not fit in

the other, better-defined genera of Lauraceae. The Central American and Southern Mexican (from the area between the Isthmus of Tehuantepec in Mexico and the Panamanian–Colombian border, hereafter referred to as Mesoamerica) species of *Ocotea* were last revised by Allen (1945), who included 33 species in the genus. Since then, additional collections from Chiapas and Guatemala have led to the description of several new species by Lundell (1965, 1969, 1970, 1971, 1974a, 1974b, 1977, 1978). In the more recent treatment of Lauraceae for the *Flora Costaricensis* (Burger & van der Werff, 1990) 42 species of *Ocotea* were recognized, including 7 new species. Rohwer (1991) reviewed the marginal species of the *O. helicterifolia* group, including the *O. heydeana* group, and described four new species. Van der Werff (1999) treated the core species of the *O. helicterifolia* group and found four additional new species. The study of recent collections of Mesoamerican Lauraceae has resulted in publications in which new *Ocotea* species have been or will be described (Gomez-Laurito, 1993, 1997; Hammel, 1986; Lorea-Hernandez & van der Werff, 2002 in press; Nelson, 1984; van der Werff, 1987, 1988a, 1988b, 1996, 2001; Wendt, 1998; Wendt & van der Werff, 1987).

SPECIES GROUPS IN *OCOTEA*

In a genus as diverse as *Ocotea*, one can expect to find several distinct species groups. Rohwer (1986) published an overview of the species of *Nec-*

¹ I thank the curators of B, BR, CAS, F, K, NY, US, and TEX for loans and Gordon McPherson for critically reading the manuscript.

² Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, U.S.A. henk.vanderwerff@mobot.org.

Table 1. *Ocotea* species with unisexual flowers in the Mesoamerican region.

<i>Ocotea adela</i>
<i>Ocotea atlantica</i>
<i>Ocotea aurantiodora</i>
<i>Ocotea calophylla</i>
<i>Ocotea cernua</i>
<i>Ocotea fendleri</i>
<i>Ocotea floribunda</i>
<i>Ocotea leucoxydon</i>
<i>Ocotea macropoda</i>
<i>Ocotea oblonga</i>
<i>Ocotea puberula</i>
<i>Ocotea rubrinervis</i>

Table 2. Species of *Ocotea* subg. *Dendrodaphne* in the Mesoamerican region.

<i>Ocotea dendrodaphne</i>
<i>Ocotea klepperiae</i>
<i>Ocotea morae</i>
<i>Ocotea veraguensis</i>

tandra Roland. ex Rottb., *Ocotea*, *Pleurothyrium* Nees, and *Rhodostemonodaphne* Rohwer & Kubitzki, largely based on a study of type specimens. He recognized a number of species groups in *Ocotea* based on characters of flowers and fruits. Among the Mesoamerican species the following groups can be recognized, starting with the best-defined groups:

1. Species with unisexual flowers. This group comprises almost half the species of *Ocotea* and is best represented in South America. In Mesoamerica one finds 12 species of this group (Table 1). Most of those are also present in South America, and only two are endemic to Mesoamerica (*O. adela* van der Werff and *O. atlantica* van der Werff). Rohwer (1986) divided this group into numerous smaller groups, based largely on the South American species. The Mesoamerican species can all be confidently assigned to these smaller groups, but listing these would be too detailed for this synopsis.

2. *Ocotea* subg. *Dendrodaphne* (Beurl.) Mez. This group is characterized by a combination of the following characters: inflorescences in the axils of bracts near the tips of the twigs; cupules with a double-rimmed margin; flowers with spreading tepals; and nearly sessile, tongue-shaped stamens with a sterile tip and a papillose indument. This is a small, but well-defined group consisting of about 10 species, with 4 species in Mesoamerica (Table 2).

3. The *Ocotea helicterifolia* group. This group shares some characters with the species of *Ocotea* subg. *Dendrodaphne* and can be recognized by the following combination of characters: inflorescences in the axils of normal leaves; cupules with a single margin; flowers with spreading tepals and stamens subsessile or infrequently with a distinct filament, sometimes tongue-shaped, densely papillose and with a sterile tip or more commonly rectangular, without a sterile tip and very sparsely papillose.

This group has been recently revised by Rohwer (1991), who studied *O. heydeana* (Mez & J. D. Smith) Bernardi and its allies, which have glabrous or very sparsely pubescent leaves, and *O. sinuata* (Mez) Rohwer and its allies, which have densely pubescent leaves and densely papillose stamens with a sterile tip, as well as by van der Werff (1999), who studied *O. helicterifolia* (Meissner) Hemsley and its allies, characterized by pubescent leaves and stamens with few papillae, without a sterile tip. This group is strongly centered in Mesoamerica, with only one species in northern South America, and includes about 32 species (Table 3).

4. The *Ocotea insularis* group. This group is characterized by two seemingly insignificant characters. One is the pubescence of the inner 3 sta-

Table 3. Species of the *Ocotea helicterifolia* group in the Mesoamerican region.

1. <i>Ocotea acuminatissima</i>
2. <i>Ocotea arcuata</i>
3. <i>Ocotea bajapazensis</i>
4. <i>Ocotea betazensis</i>
5. <i>Ocotea botrantha</i>
6. <i>Ocotea bourgeauviana</i>
7. <i>Ocotea brenesii</i>
8. <i>Ocotea congregata</i>
9. <i>Ocotea corrugata</i>
10. <i>Ocotea gordonii</i>
11. <i>Ocotea helicterifolia</i>
12. <i>Ocotea heydeana</i>
13. <i>Ocotea holdridgeiana</i>
14. <i>Ocotea lentii</i>
15. <i>Ocotea magnifolia</i>
16. <i>Ocotea mollicella</i>
17. <i>Ocotea patula</i>
18. <i>Ocotea pausiaca</i>
19. <i>Ocotea pharomachrosorum</i>
20. <i>Ocotea pittieri</i>
21. <i>Ocotea platyphylla</i>
22. <i>Ocotea praetermissa</i>
23. <i>Ocotea purpurea</i>
24. <i>Ocotea rhytidotricha</i>
25. <i>Ocotea rubriflora</i>
26. <i>Ocotea sinuata</i>
27. <i>Ocotea tonii</i>
28. <i>Ocotea valeriana</i>
29. <i>Ocotea valerioides</i>
30. <i>Ocotea verticillata</i>
31. <i>Ocotea</i> sp. A.

Table 4. Species of the *Ocotea insularis* group in the Mesoamerican region.

1. <i>Ocotea atirrensis</i>
2. <i>Ocotea austinii</i>
3. <i>Ocotea barbatula</i>
4. <i>Ocotea chiapensis</i>
5. <i>Ocotea contrerasii</i>
6. <i>Ocotea endresiana</i>
7. <i>Ocotea glaucosericea</i>
8. <i>Ocotea insularis</i>
9. <i>Ocotea jefensis</i>
10. <i>Ocotea laetevirens</i>
11. <i>Ocotea meziana</i>
12. <i>Ocotea producta</i>
13. <i>Ocotea rivularis</i>
14. <i>Ocotea rovirosae</i>
15. <i>Ocotea whitei</i>
16. <i>Ocotea viridiflora</i>

mens; these stamens have a patch of white hairs on the side facing the pistil at the junction of the filament and the anther. The second character is found in the inflorescence: the secondary, tertiary, and further branches of the inflorescence are flattened, with the axis of flattening of the tertiary branches forming a 90° angle with those of the secondary branches, those of the quaternary branches forming a 90° angle with the tertiary branches, and so on. In other characters this group conforms to the general *Ocotea* pattern: inflorescences in the axils of leaves; cupules with a single margin; flowers with erect to half-erect tepals and stamens with a distinct filament, not papillose, and without a sterile tip. This group is best represented in Mesoamerica, with one or a few species in northern South America. I would place 16 Mesoamerican species in this group (Table 4), including *O. meziana* C. K. Allen and its allies, which differ from the *O. insularis* group mainly in the light green drying leaves with raised reticulation and often yellowish major veins. My concept of this group is considerably wider than that of Rohwer (1986).

Beyond these reasonably well-defined, larger groups one can establish a larger number of poorly defined, small groups, but doing so is beyond the scope of this synopsis. Too many species would be transitional between such groups, and they would contribute little to our understanding.

If *Ocotea* is the genus to which all species that cannot be placed in other, better-defined genera of Lauraceae are assigned, one may ask if *Ocotea*, as currently accepted, is monophyletic. The answer to this question can be drawn from a recent DNA-based phylogeny of Lauraceae (Chanderbali et al.,

2001). In this study 22 species of *Ocotea*, representing several different groups, were included. Those results show clearly that *Ocotea* is not a monophyletic genus, but that the following clades can be recognized:

1. The 9 species with unisexual flowers formed a clade together with *Endlicheria* Nees and *Rhodostemonodaphne*, both genera with unisexual flowers.
2. The 3 species of the *O. helicterifolia* group formed a clade.
3. The 2 species of subgenus *Dendrodaphne* formed a clade.
4. The 4 Old World species formed a clade.
5. Three species with perfect flowers (including *O. insularis* (Meissner) Mez) formed a clade with 3 *Aniba* species and 1 *Aiouea* species.
6. A recently described species from Cameroon, *O. ikonyopke* van der Werff, was part of a clade with *Cinnamomum* species and was probably incorrectly placed in *Ocotea*.

These clades are well separated from one another, and maintaining *Ocotea* as a monophyletic genus would require a transfer of several quite distinct genera (such as *Nectandra*, *Pleurothyrium*, *Aniba* Aubl., *Licaria* Aubl.) into *Ocotea*, a solution that I do not find acceptable. Hence *Ocotea* should be considered a polyphyletic genus. Mez (1889) recognized 198 species in *Ocotea* and divided the genus into 4 subgenera: subg. *Hemiocotea* Mez, with 1 species, now placed in the genus *Urbanodendron* Mez; subg. *Dendrodaphne*, 8 species, with the same circumscription as it currently has; subg. *Mespilodaphne* (Nees) Mez, consisting of all remaining species (51) with perfect flowers; and subg. *Oreodaphne* (Nees) Mez, including all species (138) with unisexual flowers. The DNA study supports the monophyly of subgenera *Dendrodaphne* and *Oreodaphne*, but not of subgenus *Mespilodaphne*. Morphological characters for a division of subgenus *Mespilodaphne* in monophyletic groups have not yet been found.

This synopsis is based on a treatment of *Ocotea* for the *Flora Mesoamericana* and includes the 102 species found from the Isthmus of Tehuantepec in Mexico south to the border between Panama and Colombia. Mexican species only known from the area north of the Isthmus of Tehuantepec are not included. Altitudinal distribution for species also occurring outside of Mesoamerica is based on Mesoamerican specimens and does not reflect their altitudinal distribution outside this area.

KEY TO THE SPECIES OF *OCOTEA* IN MESOAMERICA

1. Stamens tongue-shaped, with a distinct, sterile tip, moderately to densely papillose; filaments lacking or very short 2
- 1'. Stamens not tongue-shaped, usually rectangular, without a sterile tip, not papillose or rarely with papillae on the margin; filaments usually present 11
- 2(1). Lowermost pair of lateral veins with conspicuous pocket domatia 41. *O. holdridgeiana*
- 2'. Leaves without conspicuous pocket domatia 3
- 3(2). Twigs and usually the leaves densely pubescent 4
- 3'. Twigs and leaves glabrous or nearly so 8
- 4(3). Leaves clustered 99. *O. verticillata*
- 4'. Leaves evenly distributed along the twigs 5
- 5(4). Lower leaf surface completely covered by the indument, the hairs short and curled 66. *O. pharomachrosorum*
- 5'. Lower leaf surface not completely covered by the indument, but partly or almost completely visible 6
- 6(5). Leaves elliptic, to 6 cm wide; petioles 5–9 mm long 46. *O. klepperiae*
- 6'. Leaves obovate or obovate-elliptic, 5–17 cm wide; petioles 1.5–4 cm long 7
- 7(6). Inflorescences paniculate-cymose; pistils densely pubescent 84. *O. sinuata*
- 7'. Inflorescences racemose; pistils glabrous 13. *O. botrantha*
- 8(3). Twigs hollow 9
- 8'. Twigs solid 10
- 9(8). Shrubs or small trees to 8 m; leaf bases plane, not revolute; inflorescences to 15 cm long; fruits ca. 2 × 1 cm; cupule ca. 1 cm diam., cup- to bowl-shaped, very weakly double-margined, the outer margin ca. 0.5 mm wide; widespread 24. *O. dendrodaphne*
- 9'. Trees to 20 m; leaf bases slightly revolute; inflorescences to 5 cm long; fruits ca. 5 × 3.5 cm, cupule ca. 5 cm diam., bowl-shaped, with a conspicuous double margin, this ca. 1 cm wide; Costa Rica 58. *O. morae*
- 10(8). Inflorescences about as long as the leaves, sparsely pubescent; leaf bases plane, not revolute; fruits 2 × 1 cm, cupule to 1.2 cm diam., with a double margin, the outer margin ca. 2 mm wide; widespread 97. *O. veraguensis*
- 10'. Inflorescences much shorter than the leaves, densely pubescent; leaf bases slightly revolute; fruits ca. 5 × 3.5 cm, cupule ca. 5 cm diam., with a conspicuous double margin, this ca. 1 cm wide; Costa Rica 58. *O. morae*
- 11(1). Lower leaf surface completely hidden by the indument 12
- 11'. Lower leaf surface glabrous or partly covered by the indument 17
- 12(11). Flowers unisexual; leaf base inrolled and decurrent along the entire length of the petiole; vernation lines visible on the lower leaf surface 16. *O. calophylla*
- 12'. Flowers perfect; leaf base plane or if inrolled and decurrent, most of the petiole distinct; vernation lines not present 13
- 13(12). Leaf base inrolled and shortly decurrent on the petiole 83. *O. salvinii*
- 13'. Leaf base plane and not decurrent 14
- 14(13). Indument of the lower leaf surface pale brown or whitish 15
- 14'. Indument of the lower leaf surface reddish brown 16
- 15(14). Domatia absent; flowers 6 mm diam., tepals 2–2.5 mm long 82. *O. salvadorensis*
- 15'. Domatia present as axillary tufts of hairs; flowers 4 mm diam., tepals 1.5 mm long 43. *O. iridescens*
- 16(14). Receptacle glabrous inside; tepals papillose on the inner surface; leaves 9–16 cm long 81. *O. rufescens*
- 16'. Receptacle appressed pubescent inside; tepals pubescent on the inner surface; leaves 7–10 cm long see discussion under 82. *O. salvadorensis*
- 17(11). Twigs hollow, often inhabited by ants 18
- 17'. Twigs solid 19
- 18(17). Inflorescences and flowers densely brown-tomentellous; leaves broadly obovate, coriaceous, with raised reticulation 44. *O. jefensis*
- 18'. Inflorescences and flowers glabrous or sparsely puberulous; leaves (narrowly) elliptic or obovate, (firmly) chartaceous, reticulation immersed or raised 5. *O. atirrensis*
- 19(17). Flowers unisexual 20
- 19'. Flowers perfect 30
- 20(19). Lower leaf surface with erect hairs, discernable to the touch 21
- 20'. Lower leaf surface glabrous or with appressed hairs, hairs not discernable to the touch 23
- 21(20). Indument completely covering the surface of the twigs 22
- 21'. Surface of the twigs partially visible between the hairs 51. *O. macropoda*
- 22(21). Laminae slightly decurrent on the petiole; laminae and petioles not sharply offset; tertiary venation on the lower leaf surface scalariform and clearly raised; indument on young twigs shaggy 30. *O. fendleri*
- 22'. Base of laminae obtuse, clearly differentiated from the petiole; tertiary venation on lower leaf surface scarcely raised and not scalariform; indument on young twigs very short, erect 6. *O. atlantica*
- 23(20). Twigs sharply angular; upper leaf surface with raised, minute reticulation 7. *O. aurantiodora*
- 23'. Twigs rounded or slightly angular; upper leaf surface without raised reticulation or with coarse reticulation 24

24(23).	Pistils pubescent; cupules plate-like, with a double margin	31. <i>O. floribunda</i>
24'.	Pistils glabrous; cupules various, but not plate-like and with a double margin	25
25(24).	Pit domatia present in the axils of the lateral veins of some leaves, the domatia not pubescent	61. <i>O. oblonga</i>
25'.	Pit domatia absent, but axillary tufts of hairs sometimes present	26
26(25).	Axillary tufts of hairs present on the lower leaf surface; tepals persistent on the cupule; oil glands readily visible on the upper leaf surface as black dots	80. <i>O. rubrinervis</i>
26'.	Axillary tufts of hairs lacking; tepals deciduous or persistent in fruit; oil glands not or scarcely visible	27
27(26).	Twigs densely and minutely gray appressed pubescent, the hairs small and scarcely individually visible; indument on the inflorescences and pedicels notably denser than on the flowers	49. <i>O. leucoxyton</i>
27'.	Twigs sparsely pubescent, individual hairs visible, or glabrous; inflorescences and flowers glabrous or density of indument on flowers and inflorescences about the same	28
28(27).	Filaments of the outer 6 stamens fused with the tepals; inflorescences and flowers glabrous	17. <i>O. cernua</i>
28'.	Filaments of the outer 6 stamens free; inflorescences and/or flowers sparsely pubescent	29
29(28).	Leaves 7–25 cm long, the tertiary venation slightly raised on the upper surface; lateral veins immersed on the upper surface	72. <i>O. puberula</i>
29'.	Leaves 4–11 cm long, the tertiary venation immersed on the upper surface; lateral veins slightly impressed on the upper surface	2. <i>O. adela</i>
30(19).	Lower leaf surfaces and young twigs with predominantly erect hairs, these discernable to the touch	31
30'.	Lower leaf surfaces and young twigs glabrous or with predominantly appressed hairs, rarely with sparse erect hairs, but these not discernable to the touch	55
31(30).	Leaf bases decurrent on the petiole and usually inrolled	32
31'.	Leaf bases not decurrent on the petiole, usually flat	35
32(31).	Young twigs appressed pubescent, the indument moderate or sparse and part of the surface always visible; inner surface of tepals glabrous or nearly so	25. <i>O. dentata</i>
32'.	Young twigs with erect or ascending hairs, the surface (nearly) completely covered; inner surface of tepals pubescent	33
33(32).	Leaf bases prominently recurved; lateral veins 9 to 12 pairs	86. <i>O. stenoneura</i>
33'.	Leaf bases scarcely if at all recurved or inrolled; lateral veins 4 to 8 pairs	34
34(33).	Indument on lower leaf surface predominantly erect; leaves 10–20 cm long	37. <i>O. hartshorniana</i>
34'.	Indument on lower leaf surface predominantly appressed; leaves 5–12 cm long	57. <i>O. monteverdensis</i>
35(31).	Outer surface of tepals densely pubescent, the surface completely covered by the indument; if inner 3 tepals with less indument on the upper half, then at least outer 3 tepals densely pubescent	36
35'.	Outer surface of all tepals glabrous or variously pubescent; if variously pubescent, the surface of the tepals always partially visible	40
36(35).	Flowers 10–14 mm diam	33. <i>O. gomezii</i>
36'.	Flowers less than 8 mm diam	37
37(36).	Inflorescences few-flowered, racemose or with some lateral branches ending in a cyme; leaves coriaceous	71. <i>O. pseudopalmana</i>
37'.	Inflorescences many-flowered, the lateral branches several times divided; leaves coriaceous or chartaceous	38
38(37).	Petioles ca. 30 mm long	3. <i>O. amplifolia</i>
38'.	Petioles up to 15 mm long	39
39(38).	Leaves coriaceous, densely ferruginous pubescent on the lower surface; cupule with entire margin; leaf apex obtuse or very shortly acuminate	23. <i>O. darcyi</i>
39'.	Leaves chartaceous, moderately to sparsely golden brown pubescent on the lower surface; tepals persisting on the cupule; leaf apex acuminate	56. <i>O. mollifolia</i>
40(35).	Inflorescences racemose or rarely with a few lateral cymes	41
40'.	Inflorescences paniculate-cymose	44
41(40).	Midvein, lateral veins, and tertiary venation clearly impressed (leaves rugose-bullate)	22. <i>O. corrugata</i>
41'.	Venation immersed or raised, not impressed (leaves not rugose-bullate)	42
42(41).	Outer surface of tepals glabrous; anthers sessile	34. <i>O. gordonii</i>
42'.	Outer surface of tepals (sparsely) pubescent; stamens with filaments $\frac{1}{3}$ or more of the length of the anthers	43
43(42).	Hairs on the lower surface of leaves ascending, covering most of the lamina; indument gray	55. <i>O. mollicella</i>
43'.	Hairs on the lower leaf surface erect, most of the lamina visible; indument brown or ferruginous	74. <i>O. purpurea</i>
44(40).	Leaves clustered	45
44'.	Leaves alternate, evenly distributed along the twigs	47
45(44).	Outer surface of the tepals glabrous	14. <i>O. bourgeauviana</i>
45'.	Outer surface of the tepals pubescent	46
46(45).	Petioles to 6 mm long; leaves 15–25 × 5–6 cm; indument of twigs yellow-brown	91. <i>O. tonii</i>
46'.	Petioles at least 10 mm long; leaves 10–15 × 6–7 cm; indument of twigs brown	20. <i>O. congregata</i>

47(44).	Flowers at anthesis 2–3 mm diam.; tepals erect to half-erect; inner surface of tepals and stamens glabrous	62. <i>O. oblongifolia</i>
47'.	Flowers at anthesis 5–10 mm diam.; tepals spreading or half-erect; inner surface of tepals and/or stamens partially papillose or pubescent	48
48(47).	Receptacle pubescent inside	49
48'.	Receptacle glabrous inside	51
49(48).	Leaves elliptic, to 15 cm long	12. <i>O. betazensis</i>
49'.	Leaves obovate, 20–40 cm long	50
50(49).	Indument completely covering young twigs and inflorescences	95. <i>O. valerioides</i>
50'.	Surface of twigs and inflorescences visible between the indument	48. <i>O. lentii</i>
51(48).	Outer surface of the tepals pubescent	64. <i>O. patula</i>
51'.	Outer surface of the tepals glabrous	52
52(51).	Inner surface of the tepals pubescent; filaments distinct, ca. $\frac{1}{3}$ the length of the anthers	53
52'.	Inner surface of the tepals glabrous; filaments not evident	54
53(52).	Leaves to 10 cm long, the tips obtuse, acute or shortly acuminate	69. <i>O. praetermissa</i>
53'.	Leaves 10–20 cm long, acuminate or gradually narrowed into a slender tip	14. <i>O. bourgeauviana</i>
54(52).	Surface of young twigs completely covered by the indument; cupule cup-shaped	94. <i>O. valeriana</i>
54'.	Surface of young twigs partially visible between the indument; cupule shallowly bowl-shaped or plate-like	38. <i>O. helicterifolia</i>
55(30).	Leaf bases inrolled and/or decurrent on the petiole or reflexed, or leaves sessile with the base weakly recurved; free petiole usually absent or very short	56
55'.	Leaf bases not inrolled or decurrent on the petiole; petioles usually distinct	65
56(55).	Flowers densely reddish pubescent; terminal buds glabrous or finely appressed pubescent distally	90. <i>O. tonduzii</i>
56'.	Flowers gray pubescent or glabrous; terminal buds uniformly pubescent or rarely glabrous	57
57(56).	Leaves usually 30–50 cm long, the apex usually rounded; domatia lacking	77. <i>O. rivularis</i>
57'.	Leaves usually less than 25 cm long, apices obtuse or rounded; domatia lacking or present	58
58(57).	Leaf bases reflexed, the lobes frequently covering the midrib; flowers glabrous	27. <i>O. endresiana</i>
58'.	Leaf bases decurrent or inrolled, but not reflexed; flowers usually puberulous	59
59(58).	Flowers 4–5 mm diam	60
59'.	Flowers 2.5–3 mm diam	61
60(59).	Outer surface of the tepals densely whitish pubescent, the surface completely covered; vernation lines visible on the lower leaf surface; receptacle (deeply) cup-shaped; Costa Rica, Panama	32. <i>O. glaucosericea</i>
60'.	Outer surface of the tepals moderately pubescent, the surface partly visible; vernation lines not visible; receptacle bowl-shaped; Mexico, Guatemala	18. <i>O. chiapensis</i>
61(59).	Leaves 5–10 cm wide, obovate, glabrous or with a few appressed hairs on the lower leaf surface; tertiary venation not or scarcely raised on upper leaf surface	42. <i>O. insularis</i>
61'.	Leaves to 5 cm wide, elliptic or oblong, appressed pubescent or glabrous on the lower leaf surface; tertiary venation immersed or raised	62
62(61).	Leaf base cuneate or acute, moderately or weakly reflexed, not decurrent on the petiole; leaves sessile	42. <i>O. insularis</i> s.l.
62'.	Leaf base decurrent on the petiole, usually inrolled; leaves petiolate	63
63(62).	Tertiary venation raised on the upper surface; leaf tips obtuse; leaf bases inrolled and decurrent	8. <i>O. austinii</i>
63'.	Tertiary venation not or rarely raised on the upper surface; if raised, leaf tips acute or acuminate and/or leaf bases decurrent, but not inrolled	64
64(63).	Apparent petiole due to decurrent leaf bases, 4–5 cm long; flowers sparsely pubescent	70. <i>O. producta</i>
64'.	Apparent petiole to 3 cm long, usually shorter; indument of flowers various	101. <i>O. whitei</i>
65(55).	Tepals papillose or partially papillose on the inner surface; tepals glabrous or sparsely puberulent outside; tepals spreading at anthesis; tepals usually longer than 3 mm	66
65'.	Tepals glabrous or pubescent on the inner surface; outer surface glabrous or variously pubescent; tepals usually erect or half-erect at anthesis; tepals usually less than 3 mm long	79
66(65).	Hairs on the lower leaf surface erect (check along midrib and lateral veins)	67
66'.	Hairs on lower leaf surface appressed or lacking	68
67(66).	Inflorescences racemose; young twigs densely pubescent with minute, erect hairs	67. <i>O. pittieri</i>
67'.	Inflorescences paniculate-cymose; young twigs moderately to densely appressed pubescent	76. <i>O. rhytidotricha</i>
68(66).	Stamens with filaments at least as long as the anthers; outer stamens curved inward	65. <i>O. pausiaca</i>
68'.	Stamens with filaments less than half as long as the anthers; outer stamens straight	69
69(68).	Pit domatia present in the axils of the lowermost lateral veins	4. <i>O. arcuata</i>
69'.	Pit domatia lacking, axillary tufts of hairs sometimes present	70
70(69).	Inflorescences densely and minutely brownish pubescent, the surface covered or nearly so	71
70'.	Inflorescences sparsely or moderately pubescent, the surface largely visible	72
71(70).	Flowers 6–7 mm diam.; widespread, from southern Mexico to Panama	79. <i>O. rubriflora</i>
71'.	Flowers 10–12 mm diam.; Osa Peninsula in Costa Rica	50. <i>O. macrantha</i>
72(70).	Leaf margin at the base (narrowly) reflexed or inrolled	68. <i>O. platyphylla</i>

72'.	Leaf margin at the base flat or nearly so	73
73(72).	Inflorescences paniculate, with at least a few 3-flowered lateral cymes, rarely racemose but then with flowers 6.5 mm or more in diameter and leaves drying greenish	74
73'.	Inflorescences racemose; leaves drying dark green or flowers less than 5 mm diam	77
74(73).	Indument on twigs brown and \pm persistent; indument on peduncle moderately dense	75
74'.	Indument on twigs pale and becoming quickly sparse with age; indument on peduncle rather sparse ..	76
75(74).	Lateral veins 6 to 9; Guatemala and Chiapas	52. <i>O. magnifolia</i>
75'.	Lateral veins 4 to 5; Costa Rica	102. <i>Ocotea</i> sp. A
76(74).	Flowers 4.5–5.5 mm diam.; lowlands	9. <i>O. bajapazensis</i>
76'.	Flowers 6.5–9 mm diam.; montane forests, mostly above 900 m	40. <i>O. heydeana</i>
77(73).	Indument on young twigs dense and consisting of short, erect hairs	67. <i>O. pittieri</i>
77'.	Indument on young twigs of variable density and consisting of appressed, rarely somewhat ascending hairs	78
78(77).	Receptacle densely pubescent inside; Costa Rica	15. <i>O. brenesii</i>
78'.	Receptacle sparsely or very sparsely pubescent inside; Mexico, Guatemala	1. <i>O. acuminatissima</i>
79(65).	Lower leaf surface with pit domatia, cavities with a small slit-like or rounded orifice, in the axils of the basal lateral veins or along the lower lateral veins; orifice usually glabrous, rarely with a fringe of hairs	80
79'.	Lower leaf surface without pit domatia; axillary tufts of hairs in a small depression sometimes present	89
80(79).	Domatia at least once, often several times, their diameter away from the midrib; three or more pairs of domatia present in each leaf; domatia with a fringe of hairs	10. <i>O. barbatula</i>
80'.	Domatia adjacent to or less than their diameter away from the midrib; domatia present in the axils of several pairs of lateral veins or only in the axil of the basal pair; domatia usually glabrous	81
81(80).	Flowers sparsely appressed pubescent; inflorescences moderately appressed pubescent	36. <i>O. haberi</i>
81'.	Flowers glabrous; inflorescences glabrous or nearly so	82
82(81).	Leaves tripliveined; domatia only present in the lowermost pair of lateral veins	96. <i>O. vanderwerffii</i>
82'.	Leaves pinnately veined; domatia often present in the axils of more than one pair of lateral veins or along the lateral veins	83
83(82).	Terminal buds glabrous	84
83'.	Terminal buds pubescent	86
84(83).	Leaves broadly elliptic, 17–27 \times 8–15 cm	29. <i>O. euenosa</i>
84'.	Leaves elliptic, 5–18 \times 1.5–7 cm	85
85(84).	Tepals spreading at anthesis; leaves, when dry, yellowish green, the midrib often lighter in color than the laminae	100. <i>O. viridiflora</i>
85'.	Tepals erect or half-erect at anthesis; leaves, when dry, dark green to blackish, the midrib concolorous with the laminae	89. <i>O. tenera</i>
86(83).	Leaf apices obtuse to rounded; leaves coriaceous; domatia conspicuous, restricted to the axils of the lowermost pairs of lateral veins	73. <i>O. pullifolia</i>
86'.	Leaf apices acute; leaves chartaceous to coriaceous; if coriaceous, domatia small and found along the lowermost lateral veins	87
87(86).	Tertiary venation on lower leaf surface immersed or nearly so; leaves coriaceous to firmly chartaceous, dark green when dry	45. <i>O. jorge-escobarii</i>
87'.	Tertiary venation on lower leaf surface raised; leaves chartaceous, black or yellowish green when dry	88
88(87).	Inflorescences to 20 cm long; leaves black when dry, the midrib very dark	11. <i>O. bernoulliana</i>
88'.	Inflorescences to 10 cm long; leaves yellowish green when dry, the main veins often lighter in color than the lamina	54. <i>O. meziana</i>
89(79).	Terminal buds glabrous (sometimes a few hairs present along the margins of the bracts surrounding the buds)	90
89'.	Terminal buds pubescent	92
90(89).	Flowers and inflorescences glabrous	98. <i>O. verapazensis</i>
90'.	Flowers and distal parts of inflorescences sparsely or moderately, minutely pubescent	91
91(90).	Leaves 15–35 \times 7–15 cm, leaf base rounded, rarely obtuse or subcordate; tepals erect or nearly so at anthesis	85. <i>O. standleyi</i>
91'.	Leaves 10–15 \times 4–5 cm, leaf base acute; tepals spreading at anthesis	53. <i>O. matudai</i>
92(89).	Twigs densely pubescent, the surface completely covered by the erect or ascending hairs	21. <i>O. contrerasii</i>
92'.	Twigs glabrous, sparsely pubescent or, if densely pubescent, the hairs appressed	93
93(92).	Leaves, when dry, yellow-green, rarely darker green; tertiary venation forming a raised reticulum on the lower leaf surface; midrib and lateral veins usually lighter in color than the surrounding leaf tissue ..	94
93'.	Leaves, when dry, dark green; tertiary venation not forming a raised reticulum on the lower leaf surface; major veins concolorous with or darker than the leaf tissue	95

94(93).	Twigs and leaves glabrous or with a few appressed hairs	47. <i>O. laetevirens</i>
94'.	Twigs and major veins on the lower leaf surface moderately pubescent with very short, erect or ascending hairs; indument on the lower leaf surface similar, but sparser	78. <i>O. rovirosae</i>
95(93).	Tepals to 1 mm long and inflorescences moderately to sparsely pubescent, the hairs ascending to erect	59. <i>O. multiflora</i>
95'.	Tepals at least 1.5 mm long; if rarely shorter (1.3–1.5 mm), then inflorescences very sparsely pubescent with appressed hairs	96
96(95).	Inflorescences densely pubescent, the surface largely or completely covered by the indument	97
96'.	Inflorescences sparsely or moderately pubescent, the surface largely or entirely visible	100
97(96).	Leaf apices rounded or obtuse; axillary tufts of hairs lacking on the lower leaf surface	19. <i>O. chrysobalanoides</i>
97'.	Leaf apices acute or acuminate; axillary tufts of hairs present on the lower leaf surface	98
98(97).	Leaves obovate, to 4 cm wide, drying green; twigs, when young, alate or sharply angled; lower leaf surface sparsely pubescent, the hairs short, erect and inconspicuous	28. <i>O. eucuneata</i>
98'.	Leaves elliptic or oblanceolate; when widest above the middle, drying black; twigs ridged or angular; lower leaf surface sparsely appressed pubescent or glabrous	99
99(98).	Leaves to 2.5 cm wide, oblanceolate or narrowly obovate-elliptic, drying black; tepals ca. 1.5 mm long	60. <i>O. nigrita</i>
99'.	Leaves 2.5–8 cm wide, elliptic or narrowly elliptic-obovate, drying green to dark green; tepals ca. 2 mm long	93. <i>O. uxpanapana</i>
100(96).	Young twigs densely pubescent, the hairs erect; inflorescences 15–20 cm long; domatia lacking	88. <i>O. subalata</i>
100'.	Young twigs appressed pubescent or nearly glabrous; if with some erect hairs, these extremely short and their orientation scarcely visible; inflorescences usually shorter than 15 cm; domatia, as axillary tufts of hairs or shallow pits, often present	101
101(100).	Leaves lanceolate; domatia consisting of shallow pits, these with a pubescent or sometimes glabrous margin	26. <i>O. effusa</i>
101'.	Leaves elliptic, ovate or elliptic-obovate; domatia, if present, consisting of axillary tufts of hairs	102
102(101).	Leaves 13–25 × 4–8 cm, the tertiary venation raised on the lower surface	35. <i>O. guatemalensis</i>
102'.	Leaves generally smaller than 12 × 5 cm; if occasionally to 15 cm long, the tertiary venation immersed on the lower surface	103
103(102).	Leaves elliptic to oblong, the apices rounded or blunt; domatia consisting of tufts of hairs, at least their own diameter away from the midrib	39. <i>O. heribertoii</i>
103'.	Leaves ovate, obovate or elliptic, the apices acute or acuminate; domatia, when present, in the axils of the lateral veins close to the midrib	104
104(103).	Leaves ovate, distally tapering into a long and slender apex	105
104'.	Leaves broadly or narrowly elliptic, without a long, slender apex	106
105(104).	Domatia present as axillary tufts of hairs; outer surface of tepals glabrous	63. <i>O. parvula</i>
105'.	Domatia absent; outer surface of tepals sparsely pubescent	87. <i>O. strigosa</i>
106(104).	Flowers glabrous or nearly so; leaves drying dark green; domatia (as axillary tufts of hairs) visible without magnification	75. <i>O. truncata</i>
106'.	Flowers pubescent, the indument covering the tepals almost completely; leaves drying green to dark green; domatia, when present, not visible without magnification	75. <i>O. racemiflora</i>

1. *Ocotea acuminatissima* (Lundell) Rohwer, Bot. Jahrb. Syst. 112: 379. 1991. *Phoebe acuminatissima* Lundell, Contr. Univ. Michigan Herb. 6: 19. 1941. *Cinnamomum acutatum* Kostermans, Reinwardtia 6: 20. 1961, nom. nov. for *Phoebe acuminatissima* Lundell. TYPE: Mexico. Chiapas: *Matuda 2107* (holotype, MICH not seen; isotype, NY!).

Phoebe saxchanalensis Lundell, Contr. Univ. Michigan Herb. 7: 14. 1942. TYPE: Mexico. Chiapas: *Matuda 4311* (holotype, MICH not seen; isotype, MO!).

Phoebe siltepecana Lundell, Wrightia 1: 151. 1946. *Cinnamomum siltepecanum* (Lundell) Kostermans, Reinwardtia 6: 23. 1961. TYPE: Mexico. Chiapas: *Matuda 5140* (holotype, LL not seen).

A variable species characterized by its racemose inflorescences, papillose inner surface of the tepals, spreading tepals at anthesis, and the sparse ap-

pressed indument on the lower leaf surface (or leaves almost glabrous).

Distribution. Mexico (Chiapas), Guatemala, from 900 to 2700 m.

2. *Ocotea adela* van der Werff, Novon 11: 501. 2001. TYPE: Panama. Prov. Panamá: Cerro Jefe, *Croat 13049* (holotype, MO!).

An inconspicuous species best recognized by its unisexual flowers, leaves with slightly impressed lateral veins, and shallow cupules with persistent tepals. It can be confused with the widespread *Ocotea cernua* (Nees) Mez, but that species has often nodding flowers, immersed (not impressed) lateral veins, and does not have persistent tepals on the cupule.

Distribution. Panama, from 500 to 900 m.

3. *Ocotea amplifolia* (Mez & Donnell Smith) van der Werff, *Novon* 11: 510. 2001. *Phoebe amplifolia* Mez & Donnell Smith, *Bot. Gaz.* (Crawfordsville) 19: 261. 1894. *Cinnamomum amplifolium* (Mez & Donnell Smith) Kostermans, *Reinwardtia* 6: 20. 1961. TYPE: Guatemala. Depto. Quiché: *Heyde & Lux 3033* (syntype, GH!).

Only known from the type collection. The long petioles (3 cm long) and the dense indument on the twigs, inflorescences, and flowers are distinctive.

Distribution. Guatemala, 3000 m.

4. *Ocotea arcuata* Rohwer, *Bot. Jahrb. Syst.* 112: 380. 1991. TYPE: Panama. El Llano–Carti Road, *Mori et al. 6883* (holotype, MO!).

A rarely collected species, best recognized by its flowers with spreading tepals with papillose inner surfaces, almost glabrous leaves with pit domatia in the axils of the lowermost lateral veins, and the loop-connected lateral veins.

Distribution. Panama, from 300 to 550 m.

5. *Ocotea atirrensis* Mez & Donnell Smith, *Bot. Jahrb. Syst.* 30, *Beibl.* 67: 18. 1901. TYPE: Costa Rica. *Donnell-Smith 4930* (syntype, US!).

Ocotea paullii C. K. Allen, *J. Arnold Arbor.* 26: 345. 1945. TYPE: Panama. Coclé: *Allen 1211* (holotype, F not seen; isotype, MO!).

Ocotea pedatifolia Mez, *Bot. Jahrb. Syst.* 30, *Beibl.* 67: 19. 1901. TYPE: Costa Rica. Talamanca, *Pittier & Tonduz, in herb. inst. phys.-geogr. Costarica 9172, 9179* (syntypes, BR!).

Ocotea pentagona Mez, *Bot. Jahrb. Syst.* 30, *Beibl.* 67: 17. 1901. TYPE: Costa Rica. Rio Naranjo, *Tonduz in herb. inst. phys.-geogr. Costarica 7613* (syntype, BR!); prope San Mateo, *Biolley 7106* (syntype, BR!); without locality, *Tonduz 8362 = Pittier & Durand 8362* (syntype, BR!).

Ocotea wedeliana C. K. Allen, *J. Arnold Arbor.* 26: 339. 1945. TYPE: Panama. Bocas del Toro: *Cooper 339* (holotype, F not seen; isotype, GH!).

A broad concept of this species is accepted here; distinctive are the hollow twigs, stamens without a sterile tip, and small cupules. For a different viewpoint, see van der Werff (1988a). Only a few *Ocotea* species in Mesoamerica have hollow twigs: *Ocotea jefensis* van der Werff differs in its tomentellous flowers and leaves with decurrent, inrolled bases, while *O. dendrodaphne* Mez has tongue-shaped stamens with a sterile tip and a double-margined cupule.

Distribution. Nicaragua, Costa Rica, and Panama, from 50 to 1200 m.

6. *Ocotea atlantica* van der Werff, *Novon* 11: 504. 2001. TYPE: Honduras. Atlántida: *Zamora 1744* (holotype, MO!).

Readily recognized by its small, unisexual flowers and the erect pubescence on the lower leaf surface and twigs; the indument obscures the surface of young twigs.

Distribution. Honduras, Nicaragua, and Costa Rica in forest on the Atlantic slopes from 50 to 400 m.

7. *Ocotea aurantiadora* (Ruiz & Pavón) Mez, *Jahrb. Königl. Bot. Gart. Berlin* 5: 295. 1889. *Laurus aurantiadora* Ruiz & Pavón, *Fl. Peruv.* 4, t. 349. 1804. TYPE: Peru. *Ruiz & Pavon s.n.* (B not seen).

Distinctive are the clearly angled twigs, the small, raised reticulation formed by the tertiary venation on the upper leaf surface, and the unisexual flowers. *Ocotea longifolia* HBK, a name widely used for South American specimens, is probably a synonym.

Distribution. Nicaragua, Costa Rica, Panama; much of South America, from 0 to 600 m.

8. *Ocotea austinii* C. K. Allen, *J. Arnold Arbor.* 26: 350. 1945. TYPE: Costa Rica. Zarcero. *Austin Smith A 125* (holotype, F not seen; isotype, MO!).

Ocotea irazuensis Lundell, *Wrightia* 5: 339. 1977. TYPE: Costa Rica. Volcán Irazú, *Proctor 32355* (holotype, LL not seen; isotype, MO!).

Best recognized by the raised reticulation on the upper leaf surface, the inrolled leaf bases, which are decurrent on the petioles, and the coriaceous, frequently oblong leaves.

Distribution. Costa Rica and Panama, from 2000 to 3000 m.

9. *Ocotea bajapazensis* Lundell, *Wrightia* 6: 8. 1978. TYPE: Guatemala. *Lundell & Contreras 20946* (holotype, LL not seen; isotypes, F!, MO!).

This species can be recognized by its sparsely appressed pubescent twigs, paniculate-cymose inflorescences, and small flowers (ca. 5 mm diam.). It is similar to *O. heydeana*, which has larger flowers (6.5–9 mm diam.) and occurs at higher altitudes.

Distribution. Guatemala, from 100 to 300 m.

- 10. *Ocotea barbatula*** Lundell, *Wrightia* 5: 336. 1977. TYPE: Guatemala. Baja Verapaz: *Lundell & Contreras 19444* (holotype, LL not seen; isotype, MO!).

This species is vegetatively similar to *O. meiziana*, but differs in having pit domatia with a pubescent margin and well away from the midrib. More collections may well show that these differences do not hold and that *O. barbatula* is better treated as a synonym of *O. meiziana*.

Distribution. Guatemala.

- 11. *Ocotea bernoulliana*** Mez, *Jahrb. Königl. Bot. Gart. Berlin* 5: 275. 1889. TYPE: Guatemala. Mujulia, *Bernoulli & Cario 2590* (syntype, U!).

Best recognized by the following combination of characters: twigs, leaves, terminal buds, and flowers glabrous, leaves with conspicuous pit domatia in the axils of lateral veins and smaller pit domatia along the lateral veins, and cupules with 6 prominent longitudinal ridges. This species is rarely collected.

Distribution. Chiapas and Guatemala, from 1000 to 1600 m.

- 12. *Ocotea betazensis*** (Mez) van der Werff, *Novon* 9: 572. 1999. *Phoebe betazensis* Mez, *Jahrb. Königl. Bot. Gart. Berlin* 5: 192. 1889. TYPE: Mexico. Oaxaca: *Liebmann 2, 3, 22, 23* (syntypes, C!), *Galeotti 2885* (syntype, not seen), *Jürgensen 575* (syntype, not seen).

Oreodaphne mexicana Meissner var. *diminuta* Meissner, DC. *Prodr.* 15(1): 118. 1864. *Ocotea mexicana* (Meissner) Hemsley var. *diminuta* (Meissner) Hemsley, *Biol. Centr. Amer., Bot.* 3: 73. 1882. TYPE: Mexico. *Jürgensen 575* (not seen).

Characteristic are the rather broad, elliptic leaves, relatively long (12–23 mm) petioles, filaments half as long as the anthers, and the densely tomentellous or tomentose twigs. This species had been included in *O. helicterifolia*, but that species has frequently obovate leaves, shorter (4–15 mm) petioles, sparse indument on the twigs, and nearly sessile anthers.

Distribution. Oaxaca, to be expected in Chiapas, 2000–2600 m.

- 13. *Ocotea botrantha*** Rohwer, *Bot. Jahrb. Syst.* 112(3): 375. 1991, non *Ocotea matudai* Lundell. *Persea matudai* Lundell, *Lloydia* 4: 49. 1941. TYPE: Mexico. *Matuda 1880* (holotype, MICH not seen; isotype, MO!).

Easily recognized by its racemose inflorescences, large flowers with tongue-shaped stamens, and densely pubescent twigs. It is closely related to *O. sinuata*, which differs in its paniculate-cymose inflorescences and densely pubescent pistils.

Distribution. Chiapas, Guatemala, El Salvador, from 800 to 2400 m.

- 14. *Ocotea bourgeauviana*** (Mez) van der Werff, *Novon* 9: 574. 1999. *Phoebe bourgeauviana* Mez, *Jahrb. Königl. Bot. Gart. Berlin* 5: 194. 1889. TYPE: Mexico. Veracruz: *Bourgeau 2234* (syntype, MO!).

Nectandra longicuspis Lundell, *Wrightia* 5: 34. 1974. TYPE: Guatemala. Izabal: *Contreras 11186* (holotype, LL not seen; isotype, MO!).

Phoebe chinantecorum Schultes, *Bot. Mus. Leaff.* 9: 170. 1941. *Cinnamomum chinantecorum* (Schultes) Kostermans, *Reinwardtia* 6: 20. 1961. TYPE: Mexico. Oaxaca: *Schultes & Reko 827* (holotype, GH!).

The combination of clustered leaves and tepals that are glabrous on the outside and pubescent on the inside is diagnostic. It can resemble *O. helicterifolia*, but that species has the inner surface of the tepals glabrous. The two collections from Guatemala and Honduras have the interior of the receptacle pubescent, while the Mexican specimens have a glabrous interior of the receptacle. More collections are needed to determine if the specimens from Guatemala and Honduras are properly placed in *O. bourgeauviana*.

Distribution. Mexico (Veracruz, Oaxaca, Chiapas), Belize, Guatemala, Honduras, from 100 to 1200 m.

- 15. *Ocotea brenesii*** Standley, *Publ. Field Mus. Nat. Hist., Bot. Ser.* 18: 454. 1937. *Nectandra brenesii* (Standley) C. K. Allen, *J. Arnold Arbor.* 26: 370. 1945. TYPE: Costa Rica. *Brenes 13653* (holotype, F!).

The racemose inflorescences and appressed indument on the young twigs characterize *O. brenesii*. It is similar to *O. pittieri* (Mez) van der Werff, but the latter species has a short, erect indument on the twigs and domatia in the form of axillary tufts of hairs.

Distribution. Costa Rica, Panama, from 700 to 2000 m.

- 16. *Ocotea calophylla*** Mez, *Jahrb. Königl. Bot. Gart. Berlin* 5: 298. 1889. *Pleurothyrium velutinum* Meissner, DC. *Prodr.* 15(1): 170. 1864. TYPE: Colombia. *Jervise s.n.* (holotype, K not seen).

Ocotea fulvescens Standley & Steyermark, Ceiba 1: 237. 1951. TYPE: Costa Rica. Cartago: *Leon 2166* (holotype, F!; isotype, MO!).

A striking species easily recognized by its densely pubescent leaves with a revolute base, the venation lines on the lower surface, and its upper montane habitat.

Distribution. Costa Rica, northern South America, from 2600 to 3000 m.

17. *Ocotea cernua* (Nees) Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 377. 1889. *Oreodaphne cernua* Nees, Syst. Laurin. 424. 1836. TYPE: Martinique. *Sieber 106* (syntype, MO!).

A common and widely distributed species with nearly glabrous twigs, leaves, inflorescences, and flowers; the unisexual flowers are often somewhat nodding or reflexed. The cupules are deeply cup-shaped; leaves are frequently somewhat tripliveined.

Distribution. From Mexico south to Bolivia and Brazil, from 0 to 700 m.

18. *Ocotea chiapensis* (Lundell) Standley & Steyermark, Publ. Field Mus. Nat. Hist., Bot. ser. 23: 114. 1944. *Nectandra chiapensis* Lundell, Contr. Univ. Michigan Herb. 6: 12. 1941. TYPE: Mexico. Chiapas: *Matuda 2042* (holotype, MICH not seen; isotype, MO!).

Distinctive are the leaves with decurrent, inrolled bases, domatia as axillary tufts of hairs, and the relatively large (5–6 mm diam.) flowers. It is similar to *O. glaucosericea* Rohwer from Costa Rica and Panama, but the latter species has a denser indument on leaves and flowers and usually lacks domatia.

Distribution. Mexico (Guerrero, Oaxaca, Chiapas), Guatemala, from 1000 to 2800 m.

19. *Ocotea chrysobalanoides* (Lundell) Lundell, Wrightia 5: 35. 1974. *Persea chrysobalanoides* Lundell, Wrightia 1: 151. 1946. TYPE: Mexico. Chiapas: *Matuda 5582* (holotype, LL not seen; isotype, MO!).

Only known from the type collection. This species can be recognized by its leaves with obtuse to rounded apices, the pubescent inner surface of the receptacle, large (0.8 mm long) staminodia, and the dense, gray indument on twigs and inflorescences.

Distribution. Mexico (Chiapas), at 2000 m.

20. *Ocotea congregata* van der Werff, Novon 9: 574. 1999. TYPE: Mexico. Chiapas: *Shilom Ton 8930* (holotype, MO!).

Can be recognized by its loosely clustered leaves, the brown to dark brown indument on the twigs, and the rather long (10 mm or more) petioles. It can be confused with *O. tonii* (Lundell) van der Werff, which differs in its shorter (to 6 mm) petioles and yellowish brown indument on the young twigs.

Distribution. Mexico (Chiapas), from 800 to 1400 m.

21. *Ocotea contrerasii* Lundell, Wrightia 5: 337. 1977. TYPE: Guatemala. Dept. Baja Verapaz: *Lundell & Contreras 19588* (holotype, LL not seen; isotype, MO!).

A rarely collected species related to *O. meiziana*, from which it differs in the dense indument on the twigs, with erect or ascending hairs and spreading hairs along the major veins on the lower leaf surface.

Distribution. Guatemala.

22. *Ocotea corrugata* van der Werff, Novon 9: 574. 1999. TYPE: Mexico. Oaxaca: *Wendt et al. 6765* (holotype, MEXU not seen; isotype, MO!).

Only known from the type collection and easily recognized by its rugose-bullate, pubescent leaves. Its racemose inflorescences are also a useful character.

Distribution. Mexico (Oaxaca), from 1100 to 1300 m.

23. *Ocotea darcyi* van der Werff, Novon 11: 505. 2001. TYPE: Panama. *Correa & Montenegro 10176* (holotype, PMA not seen; isotype, MO!).

This species is closely related to *O. stenoneura* Mez & Pittier, which differs in its inrolled and decurrent leaf bases, acute leaf apices, and elliptic leaf shape. It can also be confused with *O. pseudopalmana* Burger, but *O. darcyi* differs in having many-flowered inflorescences, a ferruginous indument (not brown), and smaller flowers (4–4.5 mm vs. 6–8 mm diam.).

Distribution. Panama, from 700 to 1000 m.

24. *Ocotea dendrodaphne* Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 238. 1889. *Dendrodaphne macrophylla* Beurl., Kongl. Vetensk. Acad. Handl. 1854: 145. 1856, non *Ocotea macrophylla* HBK. TYPE: Panama. *Billberg s.n.* (holotype, S not seen).

Ocotea ovandensis Lundell, Contr. Univ. Michigan Herb. 6: 16. 1941. TYPE: Mexico. Chiapas: *Matuda 444* (holotype, MICH not seen).

Ocotea quisara Mez & Donnell Smith, Bot. Gaz. (Crawfordsville) 33: 259. 1902. TYPE: Costa Rica. *J. Donnell Smith 6756* (syntype, BM not seen), *J. Donnell Smith 6751* (syntypes, B, K not seen), *J. Donnell Smith 6753* (syntype, K not seen).

A widespread species, easily recognized by its hollow twigs and tongue-shaped stamens with a sterile tip. The poorly known *O. morae* Gomez-Laurito shares these characters, but has leaves with an inrolled base (flat in *O. dendrodaphne*) and much larger fruits (5 × 3.5 cm vs. 2.5 × 1 cm in *O. dendrodaphne*).

Distribution. From Mexico to Panama, 50–1300 m.

25. *Ocotea dentata* van der Werff, Fieldiana, Bot., n.s. 23: 79. 1990. TYPE: Costa Rica. *Gomez & Herrera 23653* (holotype, MO!).

Distinctive are the obovate-elliptic leaves with inrolled, decurrent bases and with a rather sparse, erect indument on the lower surface, while the twigs are appressed pubescent.

Distribution. Atlantic slopes of Nicaragua, Costa Rica, and Panama, from 100 to 1000 m.

26. *Ocotea effusa* (Meissner) Hemsley, Biol. Centr. Amer., Bot. 3: 73. 1882. *Oreodaphne effusa* Meissner, DC. Prodr. 15(1): 120. 1864. TYPE: Mexico. Prope S. Pedro Nolasco, Talea etc., *Jürgensen 906* (syntype, BM!).

Best recognized by its lanceolate leaves with shallow, often pubescent pit domatia. The large (0.8 mm) staminodia are also a useful character. Several collections from higher altitude (1700–2000 m) are provisionally placed here.

Distribution. Southern Mexico, Belize, Guatemala, from 200 to 2000 m.

27. *Ocotea endresiana* Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 257. 1889. TYPE: Costa Rica. *Endres 223* (holotype, K!).

Characterized by its glabrous leaves, inflorescences, and flowers, reflexed leaf bases, and cupules without persistent tepals. Collections from Costa Rica tend to have well-developed domatia, but these are less conspicuous or even lacking in specimens from Panama. Large-leafed specimens resemble *O. rivularis* Standl. & Williams, but that species has puberulous flowers.

Distribution. Costa Rica, Panama, from 200 to 1500 m.

28. *Ocotea eucuneata* Lundell, Contr. Univ. Michigan Herb. 6: 16. 1941. TYPE: Belize. Stann Creek Distr., *Gentle 3068* (holotype, MICH not seen; isotype, MO!).

Only known from the type collection. Distinguishing features are the obovate leaves with a sparse, erect indument on the lower surface, which is best seen along the major veins, and the sharply angled young twigs.

Distribution. Belize, at 200 m.

29. *Ocotea euvonosa* Lundell, Wrightia 4: 157. 1971. *Ocotea venosa* Lundell, Phytologia 12: 245. 1965, non Gleason, 1931. TYPE: Guatemala. Alta Verapaz: *Contreras 4678* (holotype, LL!).

Known to me only from the type collection. Diagnostic are the large (to 27 × 15 cm) leaves, drying nearly black, with pinnate venation and pit domatia in the axils of the basal lateral veins. Closely related are *O. bernouilliana*, which has narrower leaves and pit domatia not only in the axils of the basal lateral veins but also along the lateral veins, and *O. vanderwerffii* (Kostermans) van der Werff, which has smaller, tripliveined leaves.

Distribution. Guatemala.

30. *Ocotea fendleri* (Meissner) Rohwer, Mitt. Inst. Allg. Bot. Hamburg 20: 152. 1986. *Gymnobalanus fendleri* Meissner, DC. Prodr. 15(1): 142. 1864. TYPE: Venezuela. *Fendler 2395* (holotype, G-DC not seen).

Known in Mesoamerica from only two collections, a pistillate and a sterile one; among the species with unisexual flowers best recognized by the dense, shaggy pubescence on the twigs, the decurrent leaf bases, and the erect indument on the lower leaf surface. Identifications of the two Mesoamerican collections are provisional.

Distribution. Panama, Venezuela, French Guyana, at 1000–1100 m.

31. *Ocotea floribunda* (Swartz) Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 325. 1889. *Laurus floribunda* Sw., Prodr. Veg. Ind. Occ., 65. 1788. TYPE: Jamaica. *Swartz s.n.* (holotype, S not seen).

A widespread species, best recognized by its pubescent pistil or pistillode, the rather large (6–7 mm diam.) flowers, and the platelike cupule with a double margin.

Distribution. From Nicaragua south to Brazil and Peru, 100–1400 m.

- 32. *Ocotea glaucosericea*** Rohwer, Mitt. Inst. Allg. Bot. Hamburg 20: 144. 1986. *Nectandra hypoglauca* Standl. ex C. K. Allen, J. Arnold Arbor. 26: 399. 1945, non *O. hypoglauca* (Nees) Mez, 1889. TYPE: Panama. Chiriquí: *Davidson 531* (holotype, F not seen; isotype, MO!).

Similar to *O. chiapensis*: see that species for a discussion of the differences.

Distribution. Costa Rica, Panama, from 1500 to 2000 m.

- 33. *Ocotea gomezii*** Burger, Fieldiana, Bot., n.s., 23: 81. 1990. TYPE: Costa Rica. *Gomez-Laurito et al. 11450* (holotype, CR not seen; isotype, MO!).

A very distinctive species with large (10–14 mm diam.) flowers, densely pubescent twigs, leaves, and flowers, and persistent tepals on the cupule.

Distribution. Costa Rica, possibly Panama, from 800 to 1400 m.

- 34. *Ocotea gordonii*** van der Werff, Novon 9: 575. 1999. TYPE: Panama. Chiriquí: *McPherson 10421* (holotype, MO!).

This species belongs to the *O. helicterifolia* group and is characterized by its racemose inflorescences, long (ca. 1 cm) pedicels, and its pubescent inner surface of the receptacle. Most other species in this group have paniculate-cymose inflorescences. In Panama only *O. purpurea* (Mez) van der Werff shares the racemose inflorescences, but that species has smaller (5 mm vs. 8–10 mm diam.) flowers.

Distribution. Panama, from 1000 to 1150 m.

- 35. *Ocotea guatemalensis*** Lundell, Wrightia 5: 339. 1977. TYPE: Guatemala. Baja Verapaz: *Lundell & Contreras 19754* (holotype, LL not seen; isotype, MO!).

A rarely collected species with rather large (to 25 × 8 cm) leaves, conspicuous domatia, and raised reticulation on the lower leaf surface. The density of the pubescence on the inflorescences increases markedly from the base toward the flowers. A few collections from Costa Rica and Panama are provisionally included here; they differ in having smaller (ca. 3 mm vs. 4–5 mm diam.), less pubescent flowers.

Distribution. Guatemala, possibly Costa Rica and Panama.

- 36. *Ocotea haberi*** van der Werff, Novon 11: 505. 2001. TYPE: Costa Rica. Guanacaste: 4–5 km NW of Monteverde, *Haber, Guindon & Brenes 11093* (holotype, MO!).

An inconspicuous species best recognized by its pubescent flowers, pit or pocket domatia, often with a narrow opening, and a pubescent inner surface of the receptacle. Most other species with pit domatia have glabrous flowers and a glabrous inner surface of the receptacle.

Distribution. Costa Rica, Panama, from 800 to 1400 m.

- 37. *Ocotea hartshorniana*** Hammel, J. Arnold Arbor. 67: 128. 1986. TYPE: Costa Rica. Heredia: *Hammel 11932* (holotype, DUKE not seen; isotype, MO!).

Best recognized by the erect or ascending hairs on the lower leaf surface, the dense, reddish brown indument on twigs and inflorescences, and the decurrent leaf bases. It is very similar to *O. monteverdensis* Burger, which has a predominantly appressed indument on the lower leaf surface and occurs at higher altitude. It can also be confused with *O. stenoneura*, but that species has inrolled, not flat leaf bases.

Distribution. Costa Rica, Panama, from 100 to 300 m.

- 38. *Ocotea helicterifolia*** (Meissner) Hemsley, Biol. Centr. Amer., Bot. 3: 73. 1882. *Oreodaphne helicterifolia* Meissner, DC. Prodr. 15(1): 123. 1864. *Phoebe helicterifolia* (Meissner) Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 193. 1889. *Cinnamomum helicterifolium* (Meissner) Kostermans, Reinwardtia 6: 21. 1961. TYPE: Mexico. Chiapas: *Linden 1641* (syntype, K!).

Nectandra corzoana Lundell, Wrightia 4: 102. 1969. *Phoebe corzoana* (Lundell) Lundell, Wrightia 5: 342. 1977. *Cinnamomum corzoanum* (Lundell) Kostermans, Reinwardtia 10: 422. 1988. TYPE: Mexico. Chiapas: *Shilom Ton 3560* (holotype, LL!).

Ocotea tenejapensis Lundell, Wrightia 4: 108. 1969. TYPE: Mexico. Chiapas: *Shilom Ton 779* (holotype, LL!).

Oreodaphne mexicana Meissner, DC. Prodr. 15(1): 118. 1864. *Oreodaphne mexicana* var. *subsessilis* Meissner, DC. Prodr. 15(1): 118. 1864, nom. superfl. = var. *mexicana*. *Ocotea mexicana* (Meissner) Hemsley, Biol. Centr. Amer., Bot. 3: 73. 1882. *Ocotea mexicana* var. *subsessilis* (Meissner) Hemsley, Biol. Centr. Amer., Bot. 3: 73. 1882, nom. superfl. = var. *mexicana*. *Phoebe nectandroides* Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 194. 1889, non *Phoebe mexicana* Meissner. TYPE: Mexico. *Galeotti 7004* (lectotype, designated here, BR!), *Jürgensen 537* (syntype, not seen).

Oreodaphne mexicana Meissner var. *longipes* Meissner, DC. Prodr. 15(1): 118. 1864. *Ocotea mexicana* (Meissner) Hemsley var. *longipes* (Meissner) Hemsley, Biol. Centr. Amer., Bot. 3: 73. 1882. TYPE: Mexico. Cerca Orizaba, *Botteri 1018* (syntype, K not seen).

Oreodaphne umbrosa Nees var. *bullata* Meissner, DC. Prodr. 15(1): 122. 1864. *Ocotea umbrosa* var. *bullata* (Nees) Hemsley, Biol. Centr. Amer., Bot. 3: 74. 1882. TYPE: Central America. *Oersted 21* (holotype, B destroyed).

Phoebe obtusata Lundell, Contr. Univ. Michigan Herb. 6: 21. 1941. *Cinnamomum obtusatum* (Lundell) Kostermans, Reinwardtia 6: 22. 1961. TYPE: Mexico. Chiapas: *Matuda 1887* (holotype, MICH not seen; isotype, CAS!).

A widespread and variable species, characterized by the hirsute indument on twigs and leaves, paniculate-cymose inflorescences, glabrous flowers, alternate leaves, and a glabrous inner surface of the receptacle. Collections placed here from Costa Rica have obovate leaves and occur at lower altitudes; they might represent a different species. *Ocotea tenepapensis*, only known from the type, is provisionally included here.

Distribution. From Mexico to Panama, at 1000–1900 m (in Costa Rica at 50–600 m).

39. *Ocotea heriberto* Wendt, Lundellia 1: 40. 1998. TYPE: Mexico. Oaxaca: *Wendt et al. 6871* (holotype, MEXU not seen; isotype, MO!).

Tall trees, known from only two collections and best recognized by their smooth leaves with an obtuse or rounded apex, presence of domatia at some distance from the midrib, and its large fruits (to 4.5 cm diam.).

Distribution. Mexico (Oaxaca, to be expected in Chiapas), at 200–300 m.

40. *Ocotea heydeana* (Mez & Donnell Smith) Bernardi, Candollea 22: 93. 1967. *Nectandra heydeana* Mez & Donnell Smith, Bot. Gaz. (Crawfordsville) 19: 262. 1894. TYPE: Guatemala. *Heyde & Lux 4260* (syntype, MO!).

Can be recognized by its rather large (6.5–9 mm diam.), glabrous flowers, paniculate-cymose inflorescences, and sparsely pubescent twigs. Similar to *O. bajapazensis*, which has smaller (4.5–5.5 mm diam.) flowers and occurs at lower altitudes, and to *O. magnifolia* (Lundell) Lundell, which has a denser indument on the twigs.

Distribution. Guatemala, El Salvador, Honduras, from 600 to 1900 m.

41. *Ocotea holdridgeana* Burger, Fieldiana, Bot., n.s. 23: 83. 1990. TYPE: Costa Rica. *Lent 1677* (holotype, F not seen; isotype, MO!).

Easily recognized by the conspicuous pocket domatia in the axils of the basal lateral veins, the large (10 mm diam.) flowers, and the stamens with a sterile tip. Leaves can be somewhat tripliveined.

Distribution. Costa Rica, Panama, from 1600 to 2400 m.

42. *Ocotea insularis* (Meissner) Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 271. 1889. *Phoebe insularis* Meissner, DC. Prodr. 15(1): 33. 1864. TYPE: Costa Rica. Cocos Island, *Menzies s.n.* (holotype, K not seen; isotype, MO!).

Aiouea lundelliana C. K. Allen, J. Arnold Arbor. 26: 419. 1945. TYPE: Panama. *White 225* (holotype, MO!).

Ocotea ira Mez & Pittier, Bull. Herb. Boiss., Sér. 2, 3: 232. 1903. TYPE: Costa Rica. *Tonduz in Herb. Inst. Phys.-Geogr. Costar. 10415* (syntype, US!), *idem 13399* (syntype, US!).

As accepted here, a variable species with rather large leaves with decurrent bases, small (2.5–3.5 mm diam.) flowers with erect tepals, and tufts of hairs on the back of the inner stamens. Montane populations have often smaller, more coriaceous leaves. Domatia are often, but certainly not always, present.

Distribution. Costa Rica, Panama, Colombia, and Ecuador, from 100 to 2000 m.

43. *Ocotea iridescens* Lorea-Hernandez & van der Werff, Brittonia 54: 2002 in press. TYPE: Mexico. Oaxaca: Salas.

Among the Mexican species of *Ocotea*, this species is distinctive because of its dense, minute, and light-colored indument on the lower leaf surface, its acuminate leaves, and slender inflorescences. It is known from a few collections made near the border of Oaxaca with Chiapas at 1400–1600 m.

44. *Ocotea jefensis* van der Werff, Novon 11: 506. 2001. TYPE: Panama. Prov. Panamá: Cerro Jefe, *Carrasquilla 2123* (holotype, MO!).

Diagnostic are the hollow twigs, obovate leaves, and small (4 mm diam.), tomentellous flowers. Its petioles are indistinct due to the decurrent leaf bases.

Distribution. Panama, from 200 to 900 m.

45. *Ocotea jorge-escobarii* Nelson, Ceiba 25: 173. 1984. TYPE: Honduras. Olancho: *Nelson & Soto 8188* (holotype, TEFH not seen; isotype, MO!).

A montane species with dark green, stiff leaves, pit domatia along the basal lateral veins, and large, ribbed cupules. Closely related is *O. pullifolia* van der Werff, which differs in leaves with obtuse or rounded apices, and in having pit domatia restricted to the axils of the basal lateral veins.

Distribution. Honduras, Nicaragua, from 1000 to 1500 m.

46. *Ocotea klepperiae* van der Werff, *Novon* 11: 508. 2001. TYPE: Costa Rica. Puntarenas: *Hammel 22068* (holotype, INB not seen; isotype, MO!).

The large flowers, tongue-shaped stamens with a sterile tip, and the position of the inflorescences in axils of bracts near the tips of the branches place this species in the subgenus *Dendrodaphne*. It differs from the other Mesoamerican species of this subgenus in the dense indument on the twigs, inflorescences, and flowers.

Distribution. Costa Rica (2 collections), from 10 to 300 m.

47. *Ocotea laetevirens* Standley & Steyermark, *Field Mus. Publ. Bot.* 23: 114. 1944. TYPE: Guatemala. Huehuetenango: Cerro Chiblac, *Steyermark 49378* (holotype, F!).

Ocotea clarkei Lundell, *Wrightia* 4: 133. 1970. Syn. nov. TYPE: Mexico. Chiapas: *Clarke 38* (holotype, DS!).

As accepted here, a variable species that includes all specimens of the *O. meiziana* group with glabrous or sparsely appressed pubescent leaves, pubescent terminal buds, and without domatia or with domatia as axillary tufts of hairs. It is close to *O. meiziana*, but that species has pit domatia on the lower leaf surface. Some collections from Costa Rica and Panama that are vegetatively indistinguishable from *O. laetevirens* have 2-celled anthers; in spite of this, they are here included in *O. laetevirens* and not described as new species of *Aiouea* Aubl.

Distribution. Mexico (Chiapas), Guatemala, Honduras, Costa Rica, and Panama, from 100 to 3000 m.

48. *Ocotea lentii* Burger, *Fieldiana, Bot.*, n.s. 23: 86. 1990. TYPE: Costa Rica. Cartago: *Lent 794* (holotype, F not seen; isotype, MO!).

Distinctive are the large (18–40 cm), obovate leaves, sparsely pubescent leaves, receptacles pubescent on the inner surface and the large (5 × 2.5 cm) fruits. It can be confused with *O. valeroides* Burger, but that species has the twigs and inflores-

cences completely covered by the indument, while in *O. lentii* part of the surface remains visible. The hairs of *O. lentii* are also coarser.

Distribution. Costa Rica, from 700 to 1400 m.

49. *Ocotea leucoxydon* (Swartz) Lanessan, *Pl. Util. Col. Franc.* 156. 1886. *Laurus leucoxydon* Sw., *Prodr. Veg. Ind. Occ.* 65. 1788. TYPE: Jamaica. *Swartz s.n.* (holotype, S not seen).

Ocotea lenticellata Lundell, *Wrightia* 5: 54. 1974. TYPE: Guatemala. Izabal: *Contreras 9924* (holotype, LL not seen; isotype, MO!).

Ocotea subsericea Standley, *Publ. Field Mus. Nat. Hist., Bot. Ser.* 18: 456. 1937. TYPE: Costa Rica. *Brenes 6789* (holotype, F!).

Diagnostic are the small, unisexual flowers, leaves with a smooth upper surface, and the minute, appressed, gray indument on the young twigs. The flowers are less densely pubescent than the pedicels. Cupules are shallow to platelike and often lenticellate.

Distribution. From Mexico to Brazil and Peru, West Indies, from 200 to 1600 m.

50. *Ocotea macrantha* van der Werff, *Novon* 11: 508. 2001. TYPE: Costa Rica. Puntarenas: Canton de Osa, *Aguilar 4688* (holotype, MO!).

Vegetatively very similar to *O. rubriflora* Mez; both have a short and dense indument on the twigs and inflorescences. However, *O. macrantha* has larger flowers (10–12 mm vs. 6–7 mm diam.).

Distribution. Costa Rica, from 100 to 200 m.

51. *Ocotea macropoda* (HBK) Mez, *Jahrb. Königl. Bot. Gart. Berlin* 5: 348. 1889. *Persea macropoda* HBK, *Nov. Gen. Sp.* 2: 127. 1817. TYPE: Colombia. *Humboldt & Bonpland s.n.* (holotype, P not seen).

Ocotea babosa C. K. Allen, *Mem. New York Bot. Gard.* 15: 82. 1966. Syn. nov. TYPE: Venezuela. *Bernardi 86* (holotype, NY!).

Best recognized by the unisexual flowers and erect indument on twigs, leaves, and flowers. In these characters *O. macropoda* resembles *O. atlantica*, but in the latter species the indument covers the surface of the twigs completely, while it remains partly visible on *O. macropoda*. *Ocotea macropoda* also has larger flowers than *O. atlantica* (5–6 mm vs. 3.5 mm diam.). I am not quite certain that the name *O. macropoda* is correctly applied here; the South American specimens (including the types of *O. macropoda* and *O. babosa*) come from much higher altitude (above 2000 m).

Distribution. Costa Rica, Panama, Colombia, Venezuela, Ecuador, from 100 to 800 m.

52. *Ocotea magnifolia* (Lundell) Lundell, *Wrightia* 5: 341. 1977. *Nectandra magnifolia* Lundell, *Wrightia* 4: 103. 1969. TYPE: Guatemala. Alta Verapaz: *Contreras* 7865 (holotype, LL not seen; isotype, MO!).

Nectandra thornei Lundell, *Wrightia* 5: 335. 1977. Syn. nov. TYPE: Mexico. Chiapas: *Thorne & Lathrop* 40526 (holotype, LL not seen; isotype, DS!).

A poorly known and poorly defined species, best recognized by its indument, which is denser than in *O. heydeana* and sparser than in *O. rubriflora* Mez.

Distribution. Mexico (Chiapas), Guatemala, from 100 to 200 m.

53. *Ocotea matudai* Lundell, *Bull. Torrey Bot. Club* 69: 388. 1942. TYPE: Mexico. Chiapas: Mt. Ovando, *Matuda* 4221 (holotype, MICH not seen; isotype, F!).

A rarely collected species best recognized by its glabrous terminal buds and leaves; flowers have spreading tepals at anthesis. The distal parts of the inflorescences have a minute, predominantly erect indument, also a useful character.

Distribution. Mexico (Chiapas), 1300–2700 m.

54. *Ocotea meziana* C. K. Allen, *J. Arnold Arbor.* 26: 360. 1945. TYPE: Costa Rica. Zarcero, *Austin Smith* H359 (holotype, F not seen; isotype, MO!).

A rather common species, characterized by its greenish drying leaves with small pit domatia along the lateral veins, pubescent terminal buds, and glabrous flowers. It is similar to *O. viridiflora* Lundell, which differs in its glabrous terminal buds, finely acute leaf apices, and smaller inflorescences (to 5 cm in *O. viridiflora*, to 10 cm in *O. meziana*). Also similar to *O. laetevirens*, but this species lacks pit domatia.

Distribution. Honduras, Nicaragua, Costa Rica, and Panama, from 100 to 1800 m.

55. *Ocotea mollicella* (Blake) van der Werff, *Fieldiana, Bot.*, n.s. 23: 88. 1990. *Phoebe mollicella* Blake, *Contr. Gray Herb.* 52: 64. 1917. *Cinnamomum mollicellum* (Blake) Kostermans, *Reinwardtia* 6: 22. 1961. TYPE: Costa Rica. Copey, *Tonduz* 11676 (holotype, GH!).

Readily recognized by its racemose inflorescences, elliptic to narrowly elliptic leaves with soft, gray

pubescence, and the densely pubescent twigs. It is infrequently collected.

Distribution. Costa Rica, from 1400 to 2300 m.

56. *Ocotea mollifolia* Mez & Pittier, *Bull. Herb. Boissier*, ser. 2, 3: 233. 1903. TYPE: Costa Rica. *Pittier* 16031 (holotype, B not seen).

Best recognized by its densely pubescent twigs, pubescent, chartaceous leaves, and many-flowered inflorescences. See also under *O. darcyi* and *O. pseudopalmana* Burger.

Distribution. Costa Rica, Panama, from 50 to 1000 m.

57. *Ocotea monteverdensis* Burger, *Fieldiana, Bot.*, n.s. 23: 89. 1990. TYPE: Costa Rica. Puntarenas: *Hartshorn* 1900 (holotype, CR not seen; isotype, MO!).

Similar to *O. hartshorniana*; see that species for differences.

Distribution. Costa Rica, from 800 to 1500 m.

58. *Ocotea morae* Gomez-Laurito, *Novon* 7: 145. 1997. TYPE: Costa Rica. Alajuela: *Gomez-Laurito & Mora* 12817 (holotype, USJ not seen; isotype, MO!).

The tongue-shaped stamens and double-margined cupule place this species in subgenus *Dendrodaphne*. It can be confused with the widespread *O. dendrodaphne*, but differs in its inrolled leaf base and large (5 × 3.5 cm) fruits.

Distribution. Costa Rica, from 100 to 800 m.

59. *Ocotea multiflora* van der Werff, *Novon* 6: 481. 1996. TYPE: Costa Rica. Puntarenas: Reserva Forestal Golfo Dulce, *Aguilar* 791 (holotype, MO!).

Tall trees, best recognized by its leaves with many (12 to 17) pairs of lateral veins, the many-flowered inflorescences, and small (2–2.5 mm diam.) flowers. It was included in Burger and van der Werff (1990) as *Ocotea* sp. B.

Distribution. Only known from the Osa Peninsula in Costa Rica, from 10 to 200 m.

60. *Ocotea nigrita* (Lundell) Lundell, *Wrightia* 5: 341. 1977. *Nectandra nigrita* Lundell, *Wrightia* 4: 132. 1970. TYPE: Guatemala. El Petén: *Contreras* 9465 (holotype, LL not seen; isotype, CAS!).

An infrequently collected species, characterized by its oblanceolate, black-drying leaves with tufts

of hairs in the axils of the basal lateral veins and the small (3–4 mm diam.), densely puberulous flowers. This species can be confused with *O. uxpanapana* Wendt & van der Werff, which differs in its longer and wider leaves (6–15 × 1.5–2.5 cm in *O. nigrita*, 10–25 × 2.5–8 cm in *O. uxpanapana*) and larger (3–4 mm vs. 4–6 mm diam.) flowers.

Distribution. Guatemala, from 200 to 300 m.

- 61. *Ocotea oblonga*** (Meissner) Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 367. 1889. *Mespilodaphne oblonga* Meissner, DC. Prodr. 15(1): 107. 1864. TYPE: French Guyana, Sagot 491 (holotype, G-DC not seen).

Phoebe mayana Lundell, Amer. Midl. Naturalist 29: 473. 1943. *Ocotea mayana* (Lundell) Lundell, Wrightia 2: 52. 1960. *Cinnamomum mayanum* (Lundell) Kostermans, Reinwardtia 10: 446. 1988. TYPE: Belize, Gentle 3187 (holotype, MICH not seen; isotype, MO!).

This species can be easily recognized by the combination of unisexual flowers and leaves with pit or slit domatia. The slender, appressed pubescent vegetative buds are also a good character.

Distribution. From Mexico to Bolivia and Brazil, from 0 to 1000 m.

- 62. *Ocotea oblongifolia*** van der Werff, Novon 11: 509. 2001. TYPE: Guatemala, Quezaltenango: Finca St. John, ca. 5 km S of Sta. Maria de Jesus, Walker 442 (holotype, US!).

Diagnostic are the oblong, densely pubescent leaves with an obtuse to subcordate base and the small (2–3 mm diam.) flowers. The indument is similar to what is found in the *O. helicterifolia* group, but the small flowers with erect to half-erect tepals are entirely different.

Distribution. Only known from the type collection, Guatemala, 1400–1800 m.

- 63. *Ocotea parvula*** (Lundell) van der Werff, Novon 11: 510. 2001. *Phoebe parvula* Lundell, Wrightia 5: 343. 1977. *Cinnamomum parvulum* (Lundell) Kostermans, Reinwardtia 10: 448. 1988. TYPE: Mexico, Chiapas: Ton 605 (holotype, LL!).

An infrequently collected species with ovate leaves, gradually tapering into the tip, domatia as axillary tufts of hairs, glabrous tepals, and small (to 5 cm long) inflorescences with frequently persisting bracts. See also *O. strigosa* van der Werff.

Distribution. Mexico (Chiapas, Oaxaca), from 1800 to 2800 m.

- 64. *Ocotea patula*** van der Werff, Novon 9: 577. 1999. TYPE: Costa Rica, Puntarenas: Aguilar et al. 2715 (holotype, MO!).

Part of the *O. helicterifolia* group and similar to *O. valeriana* (Standl.) Burger, from which it differs in its densely tomentellous inflorescences (with the surface almost entirely or entirely covered), its shorter (2–3 mm vs. 6–8 mm) pedicels, and its pubescent flowers.

Distribution. Known from two collections, Costa Rica, 1000–1400 m.

- 65. *Ocotea pausiaca*** Rohwer, Bot. Jahrb. Syst. 112: 387. 1991. TYPE: Panama, Colón: Knapp 5782 (holotype, MO!).

Part of the *O. heydeana* group, characterized by rather large, glabrous or nearly glabrous flowers with spreading tepals, these with some papillae on the inner surface, and often dark-drying leaves. It is distinct within this group by its stamens with the filaments twice as long as the anthers and the outer six stamens curved inward. Vegetatively it is like *O. rubriflora*, which differs in the very dense, minute indument on the young twigs.

Distribution. Panama, from 900 to 1500 m.

- 66. *Ocotea pharomachrosorum*** Gomez-Laurito, Novon 3: 31. 1993. TYPE: Costa Rica, San José: Gomez-Laurito et al. 12160 (holotype, CR not seen; isotype, MO!).

A very distinctive species characterized by its stamens with a sterile tip and the densely tomentellous whitish lower leaf surfaces. It was included in Burger and van der Werff (1990) as “A species of uncertain generic position” and in Rohwer (1991) as *Ocotea* sp. A.

Distribution. Costa Rica, Panama, from 1800 to 2200 m.

- 67. *Ocotea pittieri*** (Mez) van der Werff, Fieldiana, Bot., n.s. 23: 92. 1990. *Phoebe pittieri* Mez, Bot. Jahrb. Syst. 30, Beibl. 67: 16. 1901. *Cinnamomum pittieri* (Mez) Kostermans, Reinwardtia 6: 23. 1961. TYPE: Costa Rica, Alajuela: Tonduz 11893 (holotype, B not seen).

Best recognized by its racemose inflorescences and the dense, short, erect indument on the young twigs. The indument on the lower leaf surface can be very sparse and difficult to see. *Ocotea pittieri* is very similar to *O. brenesii*, which has appressed hairs on the twigs. The name *O. pittieri* was applied in Burger and van der Werff (1990) to the species here treated as *O. praetermissa* van der Werff.

Distribution. Costa Rica, from 1800 to 2200 m.

- 68. *Ocotea platyphylla*** (Lundell) Rohwer, Bot. Jahrb. Syst. 112: 390. 1991. *Phoebe platyphylla* Lundell, Contr. Univ. Michigan Herb. 6: 23. 1941. *Nectandra platyphylla* (Lundell) C. K. Allen, J. Arnold Arbor. 26: 402. 1945. TYPE: Mexico. Chiapas: *Matuda 1930* (holotype, MICH not seen; isotype, MO!).

Very similar to *O. heydeana*, from which it differs in its narrowly inrolled or revolute leaf bases.

Distribution. Mexico (Chiapas), Guatemala, El Salvador, from 900 to 2600 m.

- 69. *Ocotea praetermissa*** van der Werff, Novon 6: 482. 1996. TYPE: Costa Rica. Cartago: *Burger et al. 12065* (holotype, MO!).

Similar to *O. purpurea*, but *O. praetermissa* can be recognized by its paniculate-cymose (not racemose) inflorescences and its glabrous (not pubescent) flowers.

Distribution. Costa Rica, Panama, from 2000 to 3200 m.

- 70. *Ocotea producta*** (C. K. Allen) Rohwer, Mitt. Inst. Allg. Bot. Hamburg 20: 143. 1986. *Nectandra producta* C. K. Allen, J. Arnold Arbor. 26: 352. 1945. TYPE: Costa Rica. Prov. San José: *Skutch 3906* (holotype, GH not seen; isotype, MO!).

Only known from the type collection and characterized by the long (4–5 cm) apparent petioles with inrolled, decurrent leaf bases. The filaments of the inner 3 stamens are fused.

Distribution. Costa Rica, 700 m.

- 71. *Ocotea pseudopalmana*** Burger, Fieldiana, Bot., n.s. 23: 92. 1990. TYPE: Costa Rica. San José: *Lent 1679* (holotype, F!).

Diagnostic are the coriaceous leaves with erect indument on the lower surface, the few-flowered inflorescences, the large (6–8 mm diam.) flowers, and the montane habitat. It can be confused with *O. mollifolia*, which has chartaceous leaves, smaller (3–6 mm diam.) flowers, and occurs usually below 1000 m.

Distribution. Costa Rica, Panama, from 2200 to 2900 m.

- 72. *Ocotea puberula*** (Richard) Nees, Syst. Laurin. 472. 1836. *Laurus puberula* Richard, Actes Soc. Hist. Nat. Paris 1: 108. 1792. TYPE: French Guyana. *Le Blond s.n.* (holotype, P not seen).

Ocotea pyramidata Blake ex Brandegee, Univ. Calif. Publ. Bot. 7: 326. 1920. TYPE: Mexico. Veracruz: *Purpus 8456* (holotype, US not seen; isotype, MO!).

A widespread species, best recognized by its unisexual flowers, the slightly raised reticulation on the upper leaf surface, and the rather large, (thinly) chartaceous leaves. *Ocotea leucoxylon* has the upper surface of the leaves generally smooth and smaller (3–4 vs. 4–5 mm diam.) flowers.

Distribution. From Mexico to Argentina (in Mesoamerica known from Chiapas, Costa Rica, and Panama), from 0 to 1300 m.

- 73. *Ocotea pullifolia*** van der Werff, Novon 11: 509. 2001. TYPE: Costa Rica. Puntarenas: Canton de Golfito, *Herrera 4119* (holotype, INB!).

Closely related to *O. jorge-escobarii* from Honduras and Nicaragua. *Ocotea pullifolia* is best recognized by its obtuse or rounded leaf apices and in having pit domatia restricted to the axils of the lowermost lateral veins. In some Panamanian collections the pit domatia are lacking.

Distribution. Costa Rica, Panama, from 200 to 1100 m.

- 74. *Ocotea purpurea*** (Mez) van der Werff, Novon 9: 579. 1999. *Phoebe purpurea* Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 196. 1889. TYPE: Guatemala. Alta Verapaz: *von Tuerckheim 371* (syntypes, B, K, LE not seen, photo MO!).

Nectandra capituliforma Lundell, Wrightia 5: 33. 1974. TYPE: Guatemala. *Contreras 11235* (holotype, LL not seen; isotype, MO!).

Readily identified by its usually racemose inflorescences, rather small (to 11 cm long) leaves, and sparsely pubescent flowers. Specimens from Panama differ in having fewer lateral veins (mostly 4 pairs).

Distribution. Mexico (Oaxaca, Chiapas), Guatemala, Honduras, Panama, from 1400 to 2600 m.

- 75. *Ocotea racemiflora*** Lundell, Wrightia 4: 107. 1969. TYPE: Guatemala. Alta Verapaz: *Contreras 7904* (holotype, LL!).

Only known from the type collection, which is in fruit with a few detached, old flowers. The flat, thin cupules with persistent tepals and roundish fruits are not known from other Mesoamerican species.

Distribution. Guatemala.

- 76. *Ocotea rhytidotricha*** Rohwer, Bot. Jahrb. Syst. 112: 391. 1991. TYPE: Nicaragua. Matagalpa: *Hall & Bockus 7919* (holotype, MO!).

Part of the *O. heydeana* group and characterized by the short, erect indument on the lower leaf surface. The hairs are inconspicuous, not discernable to the touch, and are best seen along the major veins.

Distribution. El Salvador, Honduras, Nicaragua, from 1200 to 1600 m.

77. *Ocotea rivularis* Standley & L. O. Williams, *Ceiba* 1: 238. 1951. TYPE: Costa Rica. Puntarenas: *Allen 5590* (holotype, EAP not seen; isotype, MO!).

Readily recognized by its large (30–50 cm long), obovate leaves and pubescent flowers. It can be confused with *O. endresiana*, which has smaller (10–30 cm long) leaves and glabrous flowers.

Distribution. Costa Rica, from 50 to 300 m.

78. *Ocotea rovirosae* Lorea-Hernandez & van der Werff, *Brittonia* 54: 2002 in press. TYPE: Mexico. Veracruz.

This species is best recognized by the combination of its short, erect indument on twigs and leaves, the paniculate-cymose, many-flowered inflorescences, and the rather large (14–35 cm long), yellowish green drying leaves. *Nectandra lundellii* C. K. Allen, known from the same area, has similarly large, yellow-green drying leaves, but has typical *Nectandra* flowers with the inner surface of the tepals and the stamens papillose; its tepals are also spreading (not erect or half-erect) at anthesis.

Distribution. Mexico (Oaxaca, Tabasco, Veracruz), from 10 to 200 m.

79. *Ocotea rubriflora* Mez, *Jahrb. Königl. Bot. Gart. Berlin* 5: 279. 1889. *Nectandra rubriflora* (Mez) C. K. Allen, *J. Arnold Arbor.* 26: 372. 1945. TYPE: Mexico. Tabasco: *Linden s.n.* (syntype, G!).

Ocotea perseifolia Mez & Donnell Smith, *Bot. Gaz. (Crawfordsville)* 20: 10. 1895. TYPE: Guatemala. Izabal: *J. Donnell Smith 1807* (syntypes, B not seen, US not seen).

This belongs to the *O. heydeana* group in which it stands apart by the dense and minute indument on the twigs and inflorescences, which covers the surface completely. Vegetatively close to *O. macrantha*, but that species has larger flowers (10–12 vs. 6–7 mm diam.).

Distribution. From southern Mexico to Panama, at 100–350 m.

80. *Ocotea rubrinervis* Mez, *Jahrb. Königl. Bot. Gart. Berlin* 5: 351. 1889. TYPE: Peru. *Spruce 4580* (syntype, B!); Panama. *Duchassaing s.n.* (syntype, not seen).

In Mesoamerica only known from the Pacific coast of Panama and best recognized by its unisexual flowers, the readily visible gland dots on the upper leaf surface, and the shallow cupules with persistent tepals.

Distribution. Panama, from 0 to 50 m.

81. *Ocotea rufescens* van der Werff, *Novon* 6: 479. 1996. TYPE: Costa Rica. Limón: *Aguilar & Schmidt 1077* (holotype, MO!).

The only *Ocotea* species in Costa Rica and Panama (where it is expected to grow as well) with a dense, reddish brown or reddish indument on twigs and lower leaf surface. *Ocotea salvinii* Mez, from Mexico and Guatemala, has a similar indument but has inrolled leaf bases.

Distribution. Costa Rica, from 450 to 1500 m.

82. *Ocotea salvadorensis* (Lundell) van der Werff, *Novon* 6: 481. 1996. *Nectandra salvadorensis* Lundell, *Wrightia* 4: 105. 1969. *Phoebe salvadorensis* (Lundell) Lundell, *Wrightia* 5: 344. 1977. TYPE: El Salvador. *P. H. Allen 7173* (holotype, LL not seen; isotype, GH!).

Only known from the type collection. The dense, tomentellous, gray-brown indument on the lower leaf surface is diagnostic. Such an indument also occurs in *O. pharomachosorum*, which has tongue-shaped stamens with a sterile tip, and *O. iridescens*, which has domatia. A few collections from montane cloud forest in Honduras will key to *O. salvadorensis*, but differ from that species in their reddish brown indument on twigs and leaves, and the rather dense indument on the inner surface of the tepals. More collections are needed to determine if the specimens from Honduras represent an undescribed species.

Distribution. El Salvador, at 2500 m.

83. *Ocotea salvinii* Mez, *Jahrb. Königl. Bot. Gart. Berlin* 5: 264. 1889. *Phoebe salvinii* (Mez) Lundell, *Contr. Univ. Michigan Herb.* 6: 23. 1941. *Cinnamomum salvinii* (Mez) Kostermans, *Reinwardtia* 6: 23. 1961. TYPE: Guatemala. *Salvin s.n.* (syntypes, K not seen, W not seen).

Diagnostic are the ferruginous tomentellous leaves with an inrolled base and the perfect flowers. See also under *O. rufescens*.

Distribution. Chiapas and Guatemala, from 2400 to 3000 m.

84. *Ocotea sinuata* (Mez) Rohwer, Bot. Jahrb. Syst. 112(3): 373. 1991. *Nectandra sinuata* Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 402 (1889). TYPE: Guatemala. *Bernoulli & Cario 2581* (syntypes, B, GOET, K, LE all not seen).

Best recognized by its large (13–16 mm diam.) flowers, anthers with a sterile tip and densely brown-tomentose twigs. It can be confused with *O. botrantha*; see that species for differences.

Distribution. From southern Mexico to Panama, but not reported from Honduras and Nicaragua, from 200 to 1500 m.

85. *Ocotea standleyi* C. K. Allen, J. Arnold Arbor. 26: 343. 1945. *Phoebe macrophylla* Standley & Steyermark, Field Mus. Publ. Bot. 23: 116. 1944, non *Phoebe macrophylla* (Blume) Blume. 1851. TYPE: Guatemala. Alta Verapaz: *Standley 70009* (holotype, F not seen).

Readily recognized by its large (15–35 cm long) leaves with a rounded to subcordate base, and the glabrous terminal buds and leaves. A *Licaria* species occurring in Chiapas is vegetatively similar, but its flowers (with only 3 stamens) and cupule (deeply cup-shaped with a weakly developed double margin) set it apart. The *Licaria* species generally occurs below 1000 m.

Distribution. Mexico (Chiapas), Guatemala, from 800 to 2500 m, mostly above 1500 m.

86. *Ocotea stenoneura* Mez & Pittier, Bull. Herb. Boissier, ser. 2, 3: 233. 1903. TYPE: Costa Rica. San Jose de Dota, *Tonduz 13377* (lectotype, designated by Allen (1945: 334), GH not seen; isolectotype, US!).

A rarely collected species with decurrent, revolute leaf bases, an erect, rather dense indument on the lower leaf surface, and prominently raised venation on the lower leaf surface. Specimens placed here vary in cupule shape, and more collections are needed to determine if two species are involved.

Distribution. Costa Rica, Panama, possibly Colombia and Ecuador, from 700 to 1700 m.

87. *Ocotea strigosa* van der Werff, Ann. Missouri Bot. Gard. 75: 723. 1988. TYPE: Nicaragua. Matagalpa: *Stevens 22181* (holotype, MO!).

An inconspicuous species with ovate leaves and few-flowered inflorescences. It is similar to *O. parvula*, but that species has domatia and glabrous (not

sparsely pubescent) flowers. *Ocotea iridescens* is also a close relative, but differs in its dense indument on the lower leaf surface.

Distribution. Nicaragua, from 1000 to 1600 m.

88. *Ocotea subalata* Lundell, Lloydia 4: 48. 1941. TYPE: Mexico. Chiapas: *Matuda 2957* (holotype, MICH not seen; isotype, F!).

Only known from two collections. Useful characters for identification are the long (to 20 cm) inflorescences and the sharply angled or winged, densely pubescent young twigs.

Distribution. Mexico (Chiapas), from 2100 to 2500 m.

89. *Ocotea tenera* Mez & Donnell Smith, Bull. Herb. Boissier, ser. 2, 3: 234. 1903. TYPE: Costa Rica. *Pittier 13396* (syntype, US!).

Ocotea effusoides Lundell, Wrightia 6: 9. 1978. Syn. nov. TYPE: Guatemala. *Lundell & Contreras 20948* (holotype, LL not seen; isotype, MO!).

Ocotea eucymosa Lundell, Wrightia 5: 35. 1974. Syn. nov. TYPE: Guatemala. *Contreras 11215* (holotype, LL not seen; isotype, MO!).

This species is best recognized by its small size (to 12 m tall), dark-drying leaves with gland dots on the upper leaf surface, glabrous terminal buds, and small, glabrous flowers with erect or half-erect tepals.

Distribution. Guatemala and Costa Rica, from 100 to 1600 m.

90. *Ocotea tonduzii* Standley, Field Mus. Publ. Bot. 18: 456. 1937. *Ocotea cuneata* Mez, Bot. Jahrb. 30, Beiblatt 67: 17. 1901, non *Ocotea cuneata* (Grisebach) Gomez, 1889. TYPE: Costa Rica. *Tonduz 2142* (syntype, BR!).

Characteristic are the dense, reddish indument on the flowers, the large, glabrous (or finely appressed pubescent) terminal buds, the raised tertiary venation on the lower leaf surface, and the glabrous, nearly sessile leaves with an inrolled base. *Ocotea endresiana* has a similar appearance but lacks the reddish indument of the flowers.

Distribution. Costa Rica, from 1500 to 2400 m.

91. *Ocotea tonii* (Lundell) van der Werff, Novon 9: 579. 1999. *Nectandra tonii* Lundell, Wrightia 4: 106. 1969. TYPE: Mexico. Chiapas: *Shilom Ton 2014* (holotype, LL not seen; isotype, NY!).

Distinctive are the clustered leaves with short (to 6 mm long) petioles, yellow-brown indument, pa-

niculate-cymose inflorescences, and pubescent flowers. See also under *O. congregata*.

Distribution. Mexico (Chiapas), from 1000 to 1500 m.

92. *Ocotea truncata* Lundell, *Phytologia* 12: 244. 1965. TYPE: Guatemala. Alta Verapaz: *Contreras 4731* (holotype, LL not seen; isotype, US!).

This species can be recognized by its thin, dark green drying leaves with rather conspicuous domatia and its few-flowered inflorescences with glabrous flowers. The truncate apex of the young fruits is less pronounced in mature fruits and scarcely helps in the identification of this species.

Distribution. Mexico (Chiapas), Guatemala, from 700 to 1200 m.

93. *Ocotea uxpanapana* Wendt & van der Werff, *Ann. Missouri Bot. Gard.* 74: 413. 1987. TYPE: Mexico. Veracruz: Mpio. Minatitlán, *Wendt et al. 2869* (holotype, MEXU not seen; isotype, MO!).

Currently only known from the Uxpanapa region in Veracruz. It resembles *O. eucuneata* and *O. nigrita* but differs in its rather large (to 25 cm long), elliptic leaves and slightly larger flowers. The strongly lobed cupules appear to be a unique feature of this species, but cupules of *O. eucuneata* and *O. nigrita* are not yet known.

Distribution. Mexico (Veracruz), to be expected in Chiapas, from 100 to 300 m.

94. *Ocotea valeriana* (Standley) Burger, *Fieldiana, Bot.*, n.s. 23: 96. 1990. *Phoebe valeriana* Standley, *Publ. Field Mus. Nat. Hist., Bot. Ser.* 18: 460. 1937. *Cinnamomum valerianum* (Standley) Kostermans, *Reinwardtia* 6: 24. 1961. TYPE: Costa Rica. *Tonduz 11746* (holotype, F not seen).

Nectandra austinii C. K. Allen, *J. Arnold Arbor.* 26: 374. 1945. TYPE: Costa Rica. Alajuela: *Austin Smith P 2226* (holotype, A not seen).

Phoebe smithii C. K. Allen, *J. Arnold Arbor.* 26: 317. 1945. *Cinnamomum smithianum* Kostermans, *Reinwardtia* 6: 23. 1961, non *Cinnamomum smithii* Lukmanoff. TYPE: Costa Rica. Alajuela: *Austin Smith P.C. 307* (holotype, F not seen).

Similar to *O. helicterifolia*, from which it differs in its indument of the twigs (short matted hairs and longer, erect ones in *O. valeriana* vs. only long, erect ones in *O. helicterifolia*), its deeper cupules, and its presence at higher altitudes.

Distribution. Costa Rica and Panama, from 800 to 2200 m.

95. *Ocotea valeroides* Burger, *Fieldiana, Bot.*, n.s. 23: 97. 1990. TYPE: Costa Rica. *Hartshorn 1530* (holotype, CR not seen; isotype, MO!).

Distinctive are the large (to 40 cm long) leaves and the dense, tomentellous indument on the twigs and inflorescences. Differences with *O. lentii* are discussed under that species.

Distribution. Costa Rica, Panama, from 50 to 500 m.

96. *Ocotea vanderwerffii* (Kostermans) van der Werff, *Novon* 11: 511. 2001. *Phoebe glabra* van der Werff, *Ann. Missouri Bot. Gard.* 74: 406. 1987, non *Ocotea glabra* van der Werff. *Cinnamomum vanderwerffii* Kostermans, *Reinwardtia* 10: 454. 1988, non *Cinnamomum glabrum* Ettinghausen. TYPE: Mexico. Oaxaca: *Wendt et al. 4813* (holotype, MO!).

Ocotea vanderwerffii is best recognized by its dark-drying, tripliveined leaves with large pit domatia in the axils of the basal lateral veins and the glabrous flowers with erect tepals. It resembles *O. tenera*, but that species has pinnately veined leaves and small pit domatia, which are not visible on the upper surface.

Distribution. Southern Mexico from 150 to 1200 m.

97. *Ocotea veraguensis* (Meissner) Mez, *Jahrb. Königl. Bot. Gart. Berlin* 5: 240. 1889. *Sassafridium veraguensis* Meissner, DC. *Prodr.* 15(1): 171. 1864. TYPE: Costa Rica. *Bridges s.n.* (syntype, K not seen), *Oersted, Laur.* 10 (syntype, B not seen), *Warszewicz 1* (syntype, G not seen).

Ocotea bakeri Blake, *Contr. Gray Herb.* 52: 65. 1917. TYPE: Nicaragua. *Baker 2493* (holotype, GH not seen).

Ocotea escuintlensis Lundell, *Contr. Univ. Michigan Herb.* 6: 15. 1941. TYPE: Mexico. Chiapas: *Matuda 654* (holotype, MICH not seen).

Ocotea paradoxa Mez, *Bot. Jahrb.* 30, *Beibl.* 67: 16. 1901. TYPE: Costa Rica. *Tonduz in Herb. Inst. Phys.-Geogr. Costar.* 7648 (holotype, BR!).

A widespread and rather frequently collected species, best recognized by its papillose, tongue-shaped stamens with a sterile tip, solid stems, glabrous (or nearly so) leaves, and its cupules with a double margin. Can be confused with *O. dendro-*

daphne, which has hollow twigs and a pubescent inside of the receptacle.

Distribution. From southern Mexico to Panama, from 10 to 2000 m.

98. *Ocotea verapazensis* Standley & Steyermark, Field Mus. Publ. Bot. 23: 114. 1944. TYPE: Guatemala. *Standley 71421* (holotype, F!).

A poorly known species with glabrous terminal buds, twigs, and leaves, and slightly winged petioles. Vegetatively similar to *O. subalata*, but that species has densely pubescent terminal buds and pubescent inflorescences and flowers.

Distribution. Guatemala, from 1500 to 2000 m.

99. *Ocotea verticillata* Rohwer, Bot. Jahrb. Syst. 112(3): 369. 1991. TYPE: Mexico. Veracruz: *Ibarra 2328* (holotype, MO!).

Characteristic are the whorled leaves abruptly rounded at the base and its tongue-shaped stamens with a sterile tip. Related to *O. botrantha* and *O. sinuata*, both of which have alternate leaves.

Distribution. Mexico (Veracruz, Oaxaca), from 100 to 1000 m.

100. *Ocotea viridiflora* Lundell, Wrightia 5: 36. 1974. TYPE: Panama. Chiriquí: *Proctor 31916* (holotype, LL not seen; isotype, MO!).

Similar to *O. meziana*, but differing in its glabrous terminal buds and sharply acute leaf apices. Collections from Panama have persistent tepals on the cupule; those from Costa Rica do not.

Distribution. Costa Rica, Panama, from 1300 to 1800 m.

101. *Ocotea whitei* Woodson, Ann. Missouri Bot. Gard. 24: 188. 1937. *Nectandra whitei* (Woodson) C. K. Allen, J. Arnold Arbor. 26: 398. 1945. TYPE: Panama. Chiriquí: *Seibert 307* (holotype, MO!).

Ocotea eusericea Lundell, Wrightia 5: 338. 1977. TYPE: Panama. Chiriquí: *Proctor 31858* (holotype, LL not seen; isotype, MO!).

Ocotea skutchii C. K. Allen, J. Arnold Arbor. 26: 352. 1952. TYPE: Costa Rica. *Skutch 3062* (holotype, GH not seen; isotype, MO!).

As accepted here, a variable species best recognized by the dorsally pubescent filaments of the inner 3 stamens, the rather narrow (2–5 cm wide), frequently oblanceolate or obovate-elliptic leaves with a decurrent and sometimes slightly inrolled base.

Distribution. Nicaragua, Costa Rica, and Panama, from 100 to 2500 m.

IMPERFECTLY KNOWN SPECIES

102. *Ocotea* sp. A.

Resembles *O. brenesii*, from which it differs in its cymose-paniculate (not racemose) inflorescence, a denser indument of the twigs, and a glabrous (not pubescent) inner surface of the receptacle. It is only known from one collection, *Carvajal 328* (MO), from Costa Rica. It is likely an undescribed species, but more material is needed for a description. In Rohwer (1991) it was included as *Ocotea* sp. B.

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